DRAGON USER

The independent Dragon magazine

June 1988

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Editorial

TRADITIONALLY the editor is the last to know when changes occur in the publishing office. Then the editor carries the news to the readers. We promised you the big news, and the big news is ... that *Dragon User* is leaving Sunshine Publications, and taking wing westward to a new nest at the premises of the newly hatched Dragon Publications.

Dragon Publications' guardian and guvnor, however, wasn't hatched yesterday, and is better known to the Dragon World as Bob Harris of Harris Micro Software.

Dragon User is pleased, proud and grateful to Bob for shouldering the load of administrating the magazine, as its corner by the chimney stack at Little Newport Street, now full to the gills with journalists of the banking and insurance persuasion, was becoming increasingly untenable. DU's erstwhile computing relations have left for other establishments or the Outer Darkness. Sunshine, our founders, looked after us for a long time — now DU is back in the computing community.

I ask all Dragon Users to join me in wishing Bob the very best in his role as owner and guardian angel of DU. He has pledged that DU will remain an independent publication serving the whole 6809 community, as it has always been.

And he does the paperwork. Greater love hath no Dragon user.

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How to submit articles

The quality of the material we can publish in *Dragon User* each month will, to a very great extent depend on the quality of the discoveries that you can make with your Dragon. The Dragon computer was launched on to the market with a powerful version of Basic, but with very poor documentation.

Articles which are submitted to *Dragon User* for publication should not be more than 3000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should, whenever possible, be computer printed on plain white paper and be accompanied by a tape of the program.

We cannot guarantee to return every submitted article or program, so please keep a copy. If you want to have your program returned you must include a stamped addressed envelope.

Letters

This is your chance to air your views — send your tips, compliments and complaints to Letters Page, *Dragon User*, 12-13 Little Newport Street, London WC2H 7PP.

Black and white mod

HAVING received my first copy of DU, April 1988, I noticed a letter from Ken Smith regarding the display on a black and white TV or monitor.

I have three Dragon 64s on monitors which are black and white — the only mod being to remove the LM1889 IC (video modulator) which works out the colour difference signals (and makes a mess of black and white displays).

In the '32 this IC is in a socket, but in the '64 it is usually soldered into the board. However, if you are reasonable with a soldering iron you can take it out and then replace it with an IC socket. With the IC removed the computer will give a rock steady black and white display (even on a colour TV).

Also, on the subject of video, *How green is my black*, DU February 1988 by Paul Reid: if you invert the signal going into pin 32, rather than tie it to 5 volts or 0 volts, then the cursor reappears as a flashing white blob. The IC I use to invert the signal is the TTL 7404.

I have had this mod fitted to all three machines for about 18 months and had no problems, although it is still necessary to have a switch to go back to normal display for the hi res screens.

This can easily be done by using spare ways on the 7404, as this is a quad invertor.

If anybody is interested, I can supply details. This mod gives excellent dispslay with Grosvenor/BMK amateur radio software.

Dave Hughes
26 Ashburton Ave.
Birkenhead
Merseyside

Flex plea

PLEASE could you tell me where I can obtain the FLEX *Advanced Programmer's Guide*. Also, could anyone tell me whether there is a FLEX users group, similar to the OS-9 Users' Group.

P D Smith
University Hall
Birchwood
Penylan
Cardiff CF2 5YB

Every month we will be shelling out a game or two, courtesy of our supplies, to the reader/s who send the most interesting or entertaining letters. So send us your hints and your opinions, send us your hi-scores and suggestions. Send us your best Dragon stories. What d'you think we are, mind readers?!

EXTRA PUFF

A reviewer's life is a hard one

THOSE of you who bothered to read my review of *Spy Against Spy* and can still remember what I said will have noticed that I was asked for my ideas on it as a reviewer before it was completed, and I would appreciate feedback on a point that was raised as a result of this.

Originally the game had no scoring feature, and I felt strongly that this should be included, even more so in a two-player game, as I think that players like to know who has won or if they have beaten a previous high-score held by themselves or somebody else.

Maybe I am the one that is wrong but I would like to know whether it does make any difference if the game has a scoring system. Writing reviews is not easy, as I have discovered. One has to try and distance oneself slightly from the personal enjoyment of the game and consider how other people will enjoy it. A review is often the only idea that the reader can get of what the game is like. Truth and fairness have to be the main criterion, mentioning good points and bad, without being too personally biased. I am assisted in this task by my two sons aged 14 and 7 who enjoy completely different types of games.

I hope that buyers of software that I review feel that they have bought the same game that they read about in my write up. Nowadays there is not as much software to review as in the past and I wonder how much interest there would be in reviews of older material. Quite often I am at Shows and see software on sale, seemingly reasonably priced, but it is something that I have never even heard of and I wonder whether to take a chance or not. Perhaps readers of *Dragon User* would like to find out about those games and utilities which they have never seen a review about.

I know that some writers would write more about software if they had an idea of what the buying public wants, so if you have a great idea for a game or a utility why not write in to the software houses and ask them if they are interested in your idea. Let's face it, we could do with much more original software than we have been getting over the last few years. Finally this year is the Chinese Year of the Dragon, so why don't we also ensure that it really lives up to its name. To the user I say, please buy more software rather than pirating it, as we need to keep the writers working on fresh software and they need to sell more than just a handful of copies. To the writers and software houses, please give us more original software and not just variations of an old theme (yes, I appreciate that the idea for a new game is often as hard as the programming).

To those of you who have only borrowed this copy why not take out your own subscription to *Dragon User*? How many of you have still not joined the National Dragon User Group? If not, why not? Most areas have also got computer groups to go along to even if they are not solely for the Dragon. In my area there is the North West TRS80 Users Group which has a Dragon/Co-Co membership of about 40% and has meetings at Barton Aerodrome on the last Wednesday of each month. The secretary is Brian Disley and can be contacted on 061-723-5033.

Although I live in Liverpool I find this to be a very convenient meeting place and really enjoy the friendly get togethers. Why not find out about similar groups in your areas. I hope this article has inspired people to do something even if it's only a letter to DU with your views.

Mike Stott
10 Mellor Close
Prescot
Merseyside
L35 1RL

IT has been suggested before that we should review older software, and indeed from time to time we do. I am sitting on some retrospective reviews. However, we have had a good supply of new reviews this last year, and I consider these to be more important. Another factor is that I want to give priority to software which is still available from one of the Dragon traders, which means that anybody who sends us reviews of older software should include the name of the current supplier and the price.

I would like to know how Dragon and Tandy owners feel about extending DU's repertoire out into Tandy country — without of course taking over from the Dragon's supremacy. There are many areas where the two machines overlap, that could be exploited to their mutual advantage.

OS-9 group rides again

I recently wrote to you about the OS-9 group and you kindly sent me a copy of the letter from Malcolm Cowen.

I posted a copy of my correspondence to Gordon Twist last last week and when I got home that evening there was — guess what? A disc from Martin Vernon with apologies to everybody.

Many thanks for your help.

Eddie Freeman
80B Main Road
Old Duston
Northants NN5 6RA

IT sounds as though the chaps are back in business.

READ-PC and footnotes

I WILL be happy to provide working object versions of all the software listed in *READ-PC* (*Dragon User* March 1988) to those readers who send me an empty, formatted diskette (two if they want OS-9 stuff) and a self-addressed, pre paid envelope. I can handle 40 track single and double sided 5.25in and 80 track single and double sided 3.5in discs in both DragonDOS and Dragon OS-9 (and if you have some interesting self-made software — send it along!).

In the listing in line 240, some Finnish characters slipped through. The character A with two dots over it is equivalent to a *left square bracket*, obtained by pressing Shift and Down arrow at the same time on the Dragon keyboard. The little accent leaning to the right is equivalent to the *at* sign (@) on the keyboard.

The reference in the text to 'brackets' means square brackets, which on Finnish printers produce two local variants on A (Ascii 91 and 93). The 'braces' are wavy brackets, Ascii codes 123 and 125. They cannot be obtained from the keyboard, but when made using CHR$ look like reverse video square brackets on the screen.

The Dragon's cassette I/O system has been made so that characters which cannot be produced by the keyboard cannot be loaded from cassette either (I don't know why). This includes braces. The problems with *Telewriter* may have many reasons. I never tried it myself; I only trusted its advertised ability to read Ascii files, which possibly is not quite as perfect as claimed. I suggest readers write their own Microsoft Basic editor based on LINE INPUT £-1,A$ (or #-1,A$) which will certainly work.

In the meantime I made some useful changes to *READPC*. They suppress the disc drive head restore if the sector read is on the same track as the previous one, which saves enormously time and wear on the drive.

1. Delete lines 340 — 360

2. Add the following lines:

```
75 OT = -1
365 IF TRK = OT THEN 430
485 OT = TRK
```

In addition, the remark on reading 3.5in diskettes contained an omission: in addition to the changes mentioned for this purpose, the following change should be made also: in line 50, change the value of C1 from 12 to 14.

Finally, let me stress that the program will not work on a single sided (original Dragon Data) disc drive. I strongly recommend purchase of a double sided drive, which are cheap nowadays, as PC owners are changing to hard discs. If 5.25in, it should be capable of working as a standard 40 track drive.

I include a DREAM source listing of the sector read routine for those interested.

```
       ;
       ; READS A SECTOR OF A DISK
       ; (POSITION INDEPENDENT CODE)
       ;
SIDE   FCB  $82
DRIVE  FCB  $24
@GETSC PSHS D,X,Y,CC,DP
       ; MASK IRQ, FIRQ:
       ORCC §$50
       ; SET UP nmi VECTOR
       LDX  $010A
       STX  OLDNMI,PCR
       LEAX NMIVEC,PCR
       STX  $010A
       ;
       LDA  §$FF
       TFR  A,DP
       ; LOAD TIMEOUT COUNTER:
       LDY  §$FFFF
       LEAX BUFFER,PCR
       ;
       LDA  <$23   ;PIA 1B CTRL
       ORA  §$01   ;ENABLE FLAG
       STA  <$23   ;ON CB1 UP
       LDA  <$22   ;CLEAN UP SRC
       LDB  SIDE,PCR  ;read CMD
       STB  <$40   ; SUBMIT
       ; ENABLE NMI:
       LDA  DRIVE,PCR
       STA  <$48
       ;
RDLOOP LDA  <$23
       BMI  SKIPIN
       LEAY -1,Y
       BNE  RDLOOP
       BRA  EXIT
       ;
BYTLP  LDB  <$23
       BPL  BYTLP
SKIPIN LDA  <$43   ;DATA REG
       LDB  <$22   ;KUITTAUS
       STA  ,X+    ;INTO BUFFER
       BRA  BYTLP
       ;
NMIVEC LEAS 12,S
EXIT   LDB  <$22   ;KUITTAUS
       ; STOP MOTOR & DISABLE NMI:
       CLR  <$48
       STX  BUFEND,PCR
       LDX  OLDNMI,PCR
       STX  $010A,PCR
       PULS D,X,Y,CC,DP
       RTS
       ;
       ORG  15096
OLDNMI RMB  2
BUFEND RMB  2
BUFFER RMB  1024
```

Martin Vermeer
Punahilkantie 4B 14
SF-00820
Helsinki
Finland

Cursors old...

IN the March 1988 issue, Paul Reid was asking about a routine for altering the shape of the cursor.

I think the routine he was thinking of was published in the letters page of the August 1986 issue under the heading *New Shape*, from Stuart James of Wolverhapton.

Jack Lund
41 Wigan Rd.
Botlon
BL3 5QH

. . . and new, with extras

I apologise for a bit of false information in the January edition. To turn the cursor off you actually need to POKE &HFAB7,&H20 and to turn it back on POKE &HFAB7, &H26 while in 64K mode. May I make amends by giving a program that works in conjunction with Martyn Armitage's *Breaking the '64* in the February edition and gives a green on black display with auto repeat. In this case POKE &HBBB7,&H20 to turn off the cursor and POKE &HBBB7,&H26 to turn it back on.

```
150 EXEC &HC00
160 POKE 43351,15
170 POKE 46403,32
180 POKE 47736,32
190 POKE 48289,32
200 POKE 48313,32
210 POKE 48336,8
220 POKE 48340,2
230 POKE 48341,128
240 POKE 48342,96
250 POKE 48058,30
260 POKE &HFF03,
PEEK(&HFF03)AND&HFE
270 POKE &H10D,&HBF
280 POKE &H10E,&H20
290 POKE &HFF03,PEEK
(&HFF03)OR1
300 SCREEN 0,1:CLS 9
```

Nigel Mason
31 Sidaway Close
Rowley Regis
Warley
West Mids
B65 8PL

News desk

If you have any new products for the Dragon — software or hardware — ring the News Desk on 01-437 4343

An Announcement

I am very pleased and proud to be given this opportunity to take over the ownership of *Dragon User.* My commitment to the future of the Dragon is well known, and I believe that I shall be able to continue the important role that the magazine has always played in the development of the computer.

While I shall be assuming overall responsibility for the production of *Dragon User*, the financial management of the magazine will be handled by a new company, to be called Dragon Publications, quite separately from Harris Micro Software.

Most importantly, the editorial policy of the magazine will remain completely independent, and I am very pleased that Helen Armstrong has agreed to continue as Editor. Together I am sure that we shall be able to maintain the high standard of the magazine, with news, views, help and fun, and above all, to continue to provide a good service to the whole of the Dragon community.

Bob Harris

I AM sure that all Dragon users everywhere will welcome Bob Harris, who we all know as one of the most knowledgeable and most committed of Dragon supporters, to the Guv'norship of Dragon User and look forward to helping it to prosper under his care.

Dragon User's new address will be Dragon Publications, 49 Alexandra Road, Hounslow, Middlesex, TW3 4HP, and all subscriptions and correspondence should be sent to that address.

Many thanks to Sunshine Publications for running Dragon User for the last five years. DU is the last computer rag in their stable, and I'm sure they'll enjoy forwarding our letters and phone calls for many months to come.

Joysticks from Whitehouse

HARRY Whitehouse has devised an entirely new type of joystick for the Dragon — the fastest joystick known to man.

'You can operate this as fast as you can think', says Harry. That should speed a few people up — if not everyone.

The touch-sensitive joysticks have no moving parts, and respond entirely to the position of the operator's hand on four touch-sensitive, silvered pads. A central pad broadcasts a tiny radio signal, and the finger making contact with the four position pads acts as an aerial to a receiver chip underneath the pads.

The result is instantaneous response from the joystick.

'This time we have made something for the Dragon which is ahead of anything for other computers,' says Harry cheerfully, although admitting that he might adapt the design for other micros if demand arose. 'It's early days at the moment. As we don't have a production line, each one has to be put together by hand. We shall be selling them for the first time at the Ossett Show this weekend, and I think we'll have about nine to sell by then!'

'Not only is this design the fastest, it may be the cheapest as well.' The mail order cost of the joysticks from Harry Whitehouse is £9.95 each, inclusive of VAT and carriage.

In recent months, Harry has trimmed back his Dragon trading to concentrate on wider markets, but unlike many traders has continued to support the Dragon with his famous A1 Supasmooth power supplies, and now the new joysticks.

He did not give *Dragon User* a name for the new device, but as it has some qualities of a joystick (without the stick) a touchpad and a mouse, we suggest the 'Joy Touch Mouse Pad', which may have the added advantage of translating easily into Chinese for export purposes.

Orders and enquiries to Harry Whitehouse, 48 Queen Street, Balderton, Newark NG24 3ND. Tel. (0636) 705230.

Computage — a new address

COMPUTAPE's new address is Computape, 27 North End, Southminster, Essex CM0 7ND. Phone number (0621) 772589 as before.

Quick beam on disc

Orange Software have now signed an agreement with Harry Massey of Computape, which allows Orange to publish disc versions of the Quickbeam software, which is now owned by Computape.

This is an arrangement which suits Computape, who do not want to go into discs, and Orange, who are finding that the discs are selling like hot cakes.

The following Computape titles are available From Orange Software in Dragon DOS format: *Fire Force* £9.95, *Superkid* £8.95, *6809 Express* £6.45, *Shaolin Master Plus* £8.45, *Dickie's Den* £6.45, *Gordon Bennet* £4.95, *Frankie* £6.95, *Weirds of Kesh* £6.45, *Terror Castle* £6.45, *Shrunken Scientist* £6.45 and *Gordon Bennet* £4.95.

The cassette versions are available from Computape as usual.

Orange Software, The Garth, Star Road, Nant-y-Derry, Abergavenny, Gwent NP7 9DP. Tel (0873) 880252.

NDUG woos writers

A NEW copy of *Dragon Update* has fallen on the mat. The 14 page issue kicks off with Paul Grade thumping his tub about people who don't write articles for DUp, and rounds off neatly with editor Stephen Wood thumping *his* tub about people who don't write articles for DUp. This is because all the best articles are in DU, chaps!

Nevertheless, NDUG have come up with the final section of Bob Smith's Toolbox, a page on the RS232 port, some times on selling your own software, a screen dump for the DMP2000, some notes on compiling long pieces of music with *Composer*, a backup disc routine, more on machine code, a boot routine, an appeal for people to contribute to a public domain software library, a letter from a reader wondering what to write about, and the usual cartoons and classified.

Contact the National Dragon User Group via Paul Grade at 6, Navarino Road, Worthing, Sussex. Phone 0903 207585.

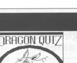
Crossword

The seventh Dragon Crossword is all dressed up and ready to go.

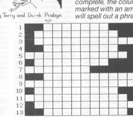
So are the winners of crossword five, who are Timothy Yates, who wants *Wizards Quest* or *Vortex Factor*, and D J Bonham, who would like a utility or a platform game. Practically minded chap, obviously.

There will be a couple of free tapes from the Editor's Magic Bottomless Box for the first correct entries out of the Editor's hat each month (we can't put them in the Bottomless Box, they fall through). You can even try telling us which tapes you'd like in an ideal world. It all depends on what we can find.

And you don't have to cut up your *Dragon User*, either — entries can be written out on a photostat or a plain piece of paper, as long as we can read them.


DRAGON QUIZ
by Terry and Derek Probyn

All this month's answers are names of Dragon software. When the crossword is complete, the column marked with an arrow will spell out a phrase.



1. Waste a timely meal! (7)
2 and 4. Jewellery for the night time (3,4,2,8)
3. A nice job lot to reform an astronaut! (3,4,5)
5. Refer lone CB freak to this army (6,5)
6. Information dropping in! (4,4)
7. Sounds like you should scarper. (7)
8. See a rook at the watering hole. (5,5)
9. Martial arts fighter. (5,7)
10. Finally, AFC meets NFC here (9)
11. Astray in a vacuum? (4,2,5)
12. Jack climbs this perhaps? (11)
13. Recall bar about running orb (5,4)

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With our great value hardware and software:

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Change cursor character, scroll disable, pause listing, BREAK disable, improved TRON, help and error messages.
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Put icons in your programs! Controlled by cursor or joystick. Commands to define, clear, load and save icon positions and windows.
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Structured BASIC on the Dragon. Allows named procedures, improved loop controls with WHILE...WEND, REPEAT...UNTIL etc.
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Enter all DOS commands, plus LIST, EDIT etc by cursor or joystick.
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Point and click operation of the entire system, with pull-down menus, pointer, dialogue box, control buttons and help messages. Includes selective directories, repeating commands, improved editing, setup module. Desktop accessories include a disk-based spooler, memo pad, snapshot, and jotter.
SPECIAL OFFER: BASIC 42 + KLIK £24.95

NEW! Accessories for KLIK:
(please send disk for updating)
JOBS ACCESSORY £2.50
Executable command file.
CALENDAR ACCESSORY £2.50
1988 Calendar
DIARY ACCESSORY £2.50
1988 Diary
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Advanced window control
CALC ACCESSORT £2.50
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ARTIST ACCESSORY £2.50
Drawing program
DUMPER ACCESSORY £2.50
Epson screen dump

HARDWARE
VIGLEN 40/80 track drives, inc Cartridge:
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Dual Drive (360-1440K) £289.95
Drives only: system price LESS £70.00
Add-on second drive with "data duck" £134.95
Superdos Cartridge with manual £75.00
Superdos controller (DOS chip only) £10.00
Blank disks (packs of 10):
40 track double-sided £4.95
80 track double-sided £5.95
Disk library box (holds 10) £2.75
Disk Head cleaner disk £4.75

MACGOWAN SOFTWARE
For Dragon 32/64 with Dragondos/Cumana DOS
PRINTER CONTROL * FROM £24.95
A text AND graphics processor
DUMPER * FROM £5.95
Versatile re-locatable screen dump program
COLOR PRINT * FROM £6.50
PMODE 3 screen dump program
STARLITE * FROM £8.00
Lightpen software, with printer dump
MONITOR/ASSEMBLER * FROM £15.00
Printer oriented assembler
* Prices vary with printer: please specify

DISK SOFTWARE
For Dragon 32/64 with Dragondos/Cumana DOS
Pixie (Mindsoft) £14.95
Icon-driven drawing program. Requires joystick.
DSKDREAM (Grosvenor) £19.95
The standard Dragon Editor/Assembler
D.R.S (Grosvenor) £9.95
Machine code database. On tape, for disk
SOURCEMAKER (Pamcomms) £8.50
Disassembler for use with DSKDREAM
DISK-KIT (Pamcomms) £9.95
Sort out your disk problems, errors etc.
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Selective mailing list program
SHAREBOX (Harris) £16.99
Manage your stocks and shares
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Full-featured Stock Control program
ORDERBOX (Harris) £16.99
Invoicing linked to Sales or Stock

Prices include UK postage. Overnight delivery (UK) ADD £5
Cheques/P.O.'s/Further details/dealer enquiries to:
HARRIS MICRO SOFTWARE
49 Alexandra Road, Hounslow, Middlesex, TW3 4HP Tel: (01) 570 8335
DR73

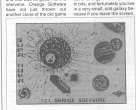
Dragonsoft

Just the right game for old addicts

Title: *Supernova*
Supplier: Orange Software, The Garth, Star Road, Nant-Y-Derry, Abergavenny.
Price: £2.99

LET me take you back in time. Way back to around 3 BD (Before Dragon), for in those long gone days the primaeval British public were addicted to a simple game called *Space Invaders*. However they began to get bored and cried out for more, and in return new hybrids appeared, of which one had razor sharp graphics and was entitled *Asteroids*. Now many years later, Orange Software have taken this aged idea and transformed it into the game *Super Nova*.

Yes, that's right, asteroids, but before you say "Why have they done another version of that. I got a cartridge of it free when I bought the computer and that was no good", let me intervene. Orange Software have not just thrown out another clone of the old game but have extracted its heart and built a more advanced program around it.



After an effective loading screen of several planets and stars, the joystick button is pressed to reveal your spherical space ship and a handful of stars whizzing around the screen. All you have to do is get rid of them by laying bombs (Proton Proximity Mines to be exact), being careful not to travel over the mines yourself and blowing yourself up. If one of the antimatter stars moves over a stationary mine then it will explode into two, doubling your problems. This happens five times, if I have counted correctly, before you finally destroy it, although the screen gets so crowded and hectic that I'm not 100% sure despite the dozens of times I've played it.

Things are never so simple though; if you collide into one of the passing stars you lose some of your vital energy. Also, the mines are limited in the number you can lay, but both mines and energy are replenishable by way of a 'lunar landing' style docking procedure when you link up to the underside of the Space Quark Proton Pump, which sounds easy but results in losing all your energy (and patience) until the precise spot to land is found.

After refuelling you have full energy and mine stocks again, but you do have spare vessels in case you prematurely run out of energy or blow yourself to bits; and fortunately you live in a very small, odd galaxy because if you leave the screen, say at the top, you immediately reappear at the bottom.

That's the basis of the game; graphics are reasonable and have four choices of colour but music is sadly only a bit of a dripping tap concerto. Things get progressively more crowded until there's hardly room to breathe, let alone slyly lay a proton proximity mine. Eventually despite gallant attempts you run out of lives, although you will no doubt be awarded posthumously with a bravery medal of the high score.

A medal is certainly what Orange Software, a name new to me, deserve for breathing new fire into such an old and dated idea. I'm not saying this is an all time classic by the way, it still has faults inherited in the genes, for one, after initial addictivenesss is metamorphosed into a credible level of aptitude and you can clear up a whole screen, there's no new challenge.

So apart from a slight shortage of variety and originality this is a title with which to pass a few hours without really raising your blood pressure or getting you to the edge of your seat unless you are an ardent fan of the old arcade game. (*You called? — Ed.*)

Philip Stott

Would you trust a hero lost in the woods?

Title: *Forest of Doom*
Supplier: Orange Software
Price: £2.99

FOREST of Doom is a program that has been converted by Orange Software for the Dragon. Unfortunately this is not a conversion of a top selling game on the Amstrad or Commodore but from the Oric, a machine which disappeared long before Dragon's problems started; and what's more the Oric version was written in 1983!

An Oric text adventure from half a decade ago may not sound mindshatteringly exciting but bearing in mind that all the best wines mature with age I took the review copy out of its orange packaging (appropriate I suppose) and loaded up while becoming familiar with the storyline ...

A prince went out to reclaim four stolen treasures but met a sorry fate resulting in your friend Arthur going out to rescue him, only to fall ill himself. Guess what you have to do? Recover the four treasures, the Prince and Arthur. If only these people were more careful in the first place.

You are also given a few clues on both the inlay and screen instructions but these tend to spoil the game rather than improve it. For instance when you are told that girls like chocolate and you find a chocolate machine it's obvious to anyone with a brain what to do.

A list of appropriate verbs is displayed, this is limited to say the least. Apart from directions they are limited basically to get, drop, examine, look, inventory, rub and kill; hardly an alternative to the Oxford English Dictionary.

The game is played on the standard green text screen with a location description and accessible exits. Starting from home you can wander off through taverns, potting sheds and dustbins initially and then later into darker worlds of dungeons and gloomy tunnels. Various characters are scattered around all of whom want something from you such as the innkeeper, the pawnbroker and even Bill and Ben who seem to have turned into grabbing scoundrels in their old age.

As the fact that Bill and Ben are in the game suggests, there is a touch of welcome humour in it, there's even a goblin with halitosis which helps breathe new life into the adventure (if you'll forgive me), but something certainly smells fishy about him (maybe not).

The adventure is well planned and logical without being overtaxing to the old grey matter. One point which irritates my mind at least though, as I briefly touched on earlier, is the shortcomings of the vocabulary. Due to the lack of verbs all you really have to do is get the required object and drop it. If you want to grow something you would 'plant seed' not just drop it, if you oil a lock you do just that, not 'drop oil'. (*Speak for yourself, clever*). Although I realise this makes no difference to the outcome of the game it does diminish the atmosphere.

Small points like the vocabulary and the pause after each response due to the limitations of the Basic program (are Basic adventures coming back? This is the second I've reviewed in a matter of weeks) detract from the potentially good, if slightly cliched storyline. I warmed more to this game as I went on but the above faults kept me from heating up further. Not too bad for summer nights though, as it won't keep you at the keyboard too many nights and is certainly better than a lot of the abysmal adventures that were around in 1983.

Philip Stott

New fonts for old

Program: *Computa-Text* and *Script*
Supplier: Dragonfire Services, 13 Parry Jones Close, Blaina, Gwent NP3 3NH
Price: £2.00 each, cassette.

ONE of the best features of MacGowan Consultants' *Printer Control* wordprocessor is the ability to load alternate character sets (fonts). *Computa-Text* and *Script* are the first two of a set of new fonts supplied on tape from Dragonfire Services.

I reviewed *Printer Control* in the August '85 edition (and the disc version in the June '86 edition), but for those readers new to this product here is a brief overview:

Printer Control is a powerful wordprocessing package supplied on either disc or tape (the tape version will take advantage of the 64's extra memory and allow you to use the RS232 port for printing). Using a 42 column, 24 line screen the text is entered and edited using the usual sort of cursor controlled screen editing commands, such as insert, delete, find and replace, as well as block move, copy and delete.

Printer Control is not a WYSIWYG (What-You-See-Is-What-You-Get) wordprocessor — all formatting (eg text centering, underlining, double width etc.) is done when printing and shows up as control characters on the screen.

The major advantage of *Printer Control* over other wordprocessors is its ability to control and take advantage of the graphics capabilities of your printer. Each copy of *Printer Control* is customised for your type of printer (so state which type you have when ordering), almost every 8-bit graphics dot-matrix printer is supported (plus a few other daisy-wheel types), over 60 printers in total. Text can be printed in 4 sizes, with italics, underlining, proportional spacing, you name it...

In addition to all this, *Printer Control* is also a Pmode 4 graphics editor. Pictures can be scrolled a single pixel at a time in all four directions, text can be added, and blocks of 8x8 pixels can be rotated through 90 degrees.

The disc version supports all the features of the original tape version (apart from the extra 32K of the Dragon 64), but also allows the keyboard repeat speed to be changed (a very useful feature), most of the useful DOS commands can also be accessed within the program (rename, kill, dskinit etc). Cassette loading and saving is also supported.

Using the graphics mode of the printer means that just about any eight by eight character set can be loaded and used (using option 9 from the *Printer Control* main menu). Dragonfire Services have taken advantage of this to produce add-on fonts on tape. The first two are *Computa-Text* and *Script*, an example of both is shown below.

The Computa-Text font looks like the 'optical characters' used on the bottom line of cheque books — it is the standard 'computer style' font. The second font, Script, is to me the most impressive. It gives you a 'hand-written' look with joined up lower case letters (the upper case is a bit 'blocky' but you can't have everything). The character matrices have been very carefully designed so that no matter which two lowercase letters are next to each other they always join-up.

The output quality will depend to a large extent on your printer, but with a good Epson the Script style can be very impressive indeed. These fonts can be printed in any of the three available sizes and can be mixed in with the standard *Printer Control* font. However, you cannot have more than one add-on font loaded at a time.

At the very reasonable price of just £2 each, these fonts are a must for *Printer Control* users — just think of the invitation cards, leaflets, newsletters etc you could use these extra fonts with.

The *Printer Control* wordprocessor program is published by MacGowan Consultants, 6 Arnhem Drive, Caythorpe, Nr. Grantham, Lincs. NG32 3DQ. It is availabe from Harris Micro Software, 49 Alexandra Road, Hounslow, Middlesex TW3 4HP. Prices start at £20 (for the disc version) but depend on your particular type of printer.

Brian Cadge

Many squares make an education

Program: *Matchmaker*
Supplier: Orange Software
Price: £2.99 cassette

WHEN Helen posted this piece of software for me to review she said in her accompanying letter that she thought it was basically an educational program. Some people might not agree with this view but I certainly do. As well as being a memory game it encourages the younger members of the Dragon community to get more familiar with the keyboard.

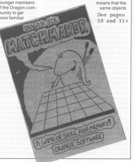
As I was asked for a quick turn round on this review I have not yet had the chance to convert it to disc, and had to put up with the slowness of cassette loading, although I was most pleased to find that there were absolutely no loading problems whatever, even though I have loaded it on many occasions. When loaded you are asked whether you would like to see the instructions or not. These are well set out and easy to understand.

You are then given the choice of 'Easy' and 'Super hard'. The former has five items which each appear six times and the latter has fifteen items each appearing twice only.

The top of the screen is lettered A-F and the side is numbered 1-5 and there are thirty squares of varying colours. At the commencement there is a horizontal and vertical rolling of the lines of squares, alternate rows going in opposite directions, which gives a nice touch to the game but unfortunately causes problems to the game itself.

The items are obviously set out in the same squares at the beginning of each game and rely on the Dragon's randomiser, which is notoriously bad, to select the number of times the squares move. This means that the same objects

See pages 10 and 11→



Update the Dragon

Roger Merrick says, don't criticise the Dragon — boost it.

WHEN you see that for the original price of a Dragon 32 and a disc system, you could have a 512K Amstrad PC, or a 1M Atari ST with fast, impressive multi-multi-colour graphics, you can understand why people like Roy Coates talk of hanging up their Dragon and moving on to pastures new.

However, what I want to do here is make the case for persevering with the old beast, through enhancing and upgrading the standard machine. This need not involve getting out the soldering iron — astute purchasing of peripherals can dramatically extend the utility of your system, by tailoring it to meet your specific requirements. Upgrading to a completely different system has additional costs above and beyond the price of the computer — you will have to write off your present investment in software, and build up a new software resource (at much higher prices). The resale value of Dragon hardware and software is low, compared to the purchase price. There is no guarantee that peripherals such as disc drives, monitors, or printers, will be useful with your new system. The cost of these items can be overlooked when drooling over the latest faveroonie all singing all dancing multi-megaram executive toy. Then you need to consider why you feel you need a new machine: is it because your present computer can't do something that you want to do? Or is it simply that the Dragon has gone out of fashion, people sniff when you speak excitedly of it and what it can do? Maybe you can jazz it up.

RAM enlargement

For a Dragon 32 to be upgraded to 64K is nowadays fairly cheap. It is also relatively straightforward. Although I don't think DU has ever published details , NDUG publish a booklet which is very clear. If you intend to make this modification to your machine, get on with it, because 64K ramchips are becoming scarce as demand falls (64K is now too small). Various people will do the upgrade for you. It is worth considering, however, whether it would be more cost-effective to purchase a second-hand D64, and get the RS232 port, the extra ROM space (a socketed EPROM containing the cassette-based D64 system, invoked by EXEC48000, that can be replaced with something more useful), and keep the D32 as a second machine, or a source of spare parts.

256K upgrades for Dragon 32 and 64 are possible, but are not as useful as one might hope (due to the unavailability of suitable memory management chips; the onboard SAM can only switch between map 0 and 1, and the 6809 can only address up to 64K contiguously). Details have been published by NDUG.

The 128K upgrade available from Compusense (which includes an 80 column video display) seems to me to be rather expensive at over £100. The additional memory is configured as cache-ram ('ram disc') when used with OS-9 (or Flex, I believe). Purchased second-hand, it sounds like it could be a bargain (anyone want to get rid of one, cheap?)

Dragonplus can be used with a D32, but the machine will require an upgrade to 64K first.

For 32 to 64K upgrades, software that enables the user to switch between map types should be provided with the upgrade. Disc users who do not operate entirely under either of the two sophisticated DOSs might like to be able to switch their 64K ram machine to ram-mode, and, for example, load in from disc patches to the DOS (which has been copied to RAM).

It is possible, by switching out interrupts, to work from map 0, and use the upper 32K of map 1 as a data store, or a graphic display area, etc. Anyone cracked this?

Plug-in peripherals

Disc interface. If you don't have a disc interface, then getting one is the simplest way of dramatically extending the power of your micro. There is still quite a wide choice — the original Dragondos system can be obtained second-hand; two companies are still manufacturing enhanced Dragondos-compatable systems. Then there is the Premier Delta system, available in single and double density versions, second-hand only. The Premier system has much to commend it, not least a second Eprom socket; and although more software was made available for the DragonDOS system, the Delta Users group (DUDE), is now originating software for the Premier system. Finally, the Andtek cartridge is intended for use with Flex, and is still available. Unlike the other cartridges mentioned, which can be used with their own inbuilt commands, the Andtek unit requires the use of Flex (and adds RAM to a 32K machine to facilitate this). It is not cheap, and probably not for a beginner at discs.

Additional drives. If you already have a disc system, but only have single drive, you ought to add a second drive. This will make a big difference to your disc operations. If you have OS9, you'll agree with Dale Puckett that two drives are essential for serious OS-9 work. But even using Dragon or Delta DOS, a second drive is a big step forward.

First advantage is in backing up — it takes only a fraction of the time of a single drive backup.

In many DOSs, COPY will not work on a single drive system. (Instead, in systems which produce BAK. files, or where COPY allows renaming of files, it produces a duplicate of the file on the *same* disc.)

But the real advantage comes when the user designates one drive for read and write operations, and uses another for read only. A disc full of applications and utlilities can be kept write-protected in drive zero and all updates and data storage done on drive one. File handling applications can be purchased or written that access data files up to a single disc in length, portions of the file being read into memory when required. Although this is a feature of OS-9, it is also perfectly possible with DragonDOS.

If you have an original Dragon Data single sided 40 track half height unit, a second half height drive can be fairly easily installed into the drive casing (I've done it). All the cables and connectors are ready for you. You will need to move a jumper on one of the drives to set it as drive 2, and you may need to remove a terminating resistor. Then the question of what kind of drive to add arises. The choice of disc size needs to be considered. Three inch drives are a relatively unpopular format, and discs are expensive. However, the single sided drives use reversible discs, and are obtainable for under £30. They are to be particularly recommended for use with handicapped or young children. I am quite happy for my 5 and 6 year olds to insert and eject the discs for their three inch drives.

The three and a half format is also robust, and more popular. However, their popularity means that drives are not so cheaply available; however, as high capacity formats become more popular, older lower capacity drives may be unloaded onto the hobbiyest market cheaply.

Still the cheapest overall format is the 5.25 disc. The drives may cost a bit more, but 5.25 discs are obtainable very cheaply. Presently, at high street prices, the cost of 20 three inch discs exceeds the price of the drive, but the same amount of money could purchase 100 5.25 discs.

A matched pair of drives is the most attractive option. Single sided 40 track drives are relatively unpopular now, and should be obtained cheaply.

Bargains are to be had with double sided 80 track drives, as they have gone out of favour. However, remember that unless they are 40/80 switchable, you won't be able to read most commercially supplied Dragon software, and DragonDOS and the Dragon Data release of OS-9 has problems with 80 track formats.

If the drives do not match, you lose much of the advantage of having twin drives, so if adding a higher capacity or different size drive, buy a pair.

Cartridge port expander. If you make much use of the expansion port, you'll find the contacts become loose. The machine is not as powerful, connecting one piece, disconnecting another, as it would be if we could connect several peripherals to the expansion port together. Some units allow piggy-backing of a DOS cartridge, eg The Touchmaster Graphics Tablet, the (new) Peaksoft modem package. This works because the DOS cartridge uses only the lower 8K of the cartridge space, and the operating software of the application cartridge (I believe) uses the upper part. There need be no clever electronic paging in and out of ROMs.

The snag with these piggy-back systems is that they'll only work while the conditions they assume still obtain. Plug in a Delta or a Cumana cartridge, let someone bring out a new extended DOS, and the space the application cartridge requires has gone. There is also the question of how often you want to use the application — suppose you have a modem and a graphics tablet — you can't double piggy back them.

A neater and more flexible solution is to attach a Cartridge Port Expander. There is a choice of three — Tandy's Multi-Pak interface for the Color Computer requires a slight modification before it should be used with the Dragon, but otherwise works well. It has the advantage that a number of Tandy peripherals were designed for use with it. On the other hand, not all these peripherals work well with the Dragon (see later).

Compusense marketed a unit manufactured by Race, and the final example is the Wyvern expander board, originally available through the long-defunct Dragon Dungeon user group.

Each unit offers four slots, where previously there was one, and software switching between slots is possible. It is therefore possible to transfer data from a device in one slot to a device in another, controlled by software. For example, transferring files between DragonDOS and DeltaDOS cartridges. Making the best use of the facilities provided by the Cartridge Port Expander may require the writing or purchase of specialised software. None of these units is available new, and second-hand units seem hard to find. The original prices were relatively high (£100-£150). There is scope for a bright spark to reissue one of the British designs.

RS232. You would think a plug-in would mainly be of interest to the D32 owner. However, users of serial printers may wish to communicate without disconnecting the printer.

The RS232 port could be used for printing to a serial printer; Prestel/Telex/Micronet/bulletin board applications; operating from a terminal; direct communication with a different computer.

If you find that your dissatisfaction with the Dragon centres on the display device and/or the keyboard, connecting a terminal via the RS232 could be a satisfactory solution. An old Hazeltine 2000 terminal was recently advertised in our local paper for the very modest cost of £10.

Owning a number of Dragons (or CoCos), linked via the RS232, could be an inexpensive way of providing the kids with a computer each, and saving the cost of peripherals. The Tandy Deluxe RS232 pack works well with the Dragon, and is supported by OS-9 modules provided in CoCo OS-9 issue 2, to work from the Multi-Pak.

Compusense had an RS232/I/O unit which offered additional facilities and a full 25 pin D socket RS232. The original Microcomputer Resources Cartridge D32-modem link supports Prestel-like comms, but (obviously) not downloading to disc. The upgraded version by Peaksoft I havent yet tried.

Sideways ROM: One of the features of the BBC that was attractive many moons ago was the ability to 'page' in one of a bank of sideways ROMs. The sideways ROM cartridge, marketed by Compusense, no longer available, offered Dragon users the opportunity to select from a bank of four 16K ROMs. The unit plugs into the cartridge port, so prevents disc use unless used with a cartridge port expander. Coco users should note that the unit is NOT, as it stands, compatable with CoCo, but a minor patch to the operating software should correct this.

As the designer once said, it is a relatively simple design, and could be resurrected by a suitably motivated entrepreneur. Think of the advantage of being able to switch to an in-line assembler/disassembler, *Edit+*, a word-processor, or utilities toolkit, or of using these in an unexpanded D32 with no memory overhead. Advice — get one if you can.

EPROM programmer:

If you have a D64, or an RS232 cartridge with a D32, any Eprom programmer that receives data via an RS232 may be used to prepare Eprom software. However, Compusense sold a unit that plugged into the expansion (cartridge) port, with onboard software.

Update and debug your DOS chip; blow utilities onto ROM for use in your sideways ROM cartridge. For the terminally lazy, Compusense's *Eprommer* enables the user to blow Basic programs onto Eprom, for use in the sideways ROM cartridge.

Make use of the full 15.75K of the cartridge port — you would be surprises how few cartridges make use of even half of it.

The only snag is that small (128K-bit) Eproms are becoming expensive and scarce. Invest in an ultra-violet Eprom eraser to wipe games cartridges and use the Eproms for utilities.

The Compusense *Eprommer* can read and program software for other computers.

The Eprommer cartridge is not very easily used in a cartridge port expander, since these hold the cartridges vertically, with their base towards the user. An extendiport (see later) is required.

CoCo users should again note that the Compusense unit is NOT compatible with their machine without a minor patch to the operating software.

Speech sound cartridge: Visually disabled users, or people working with ESN or young children, may find that a cartridge which 'speaks' all string output, even articulating numbers correctly, is an extremely valuable aid. More trivially, the entertainment value of the 'talking computer' delights little old me, as well as the chronological children. The Tandy speech sound cartridge is totally compatible with the Dragon, and in addition to speech can be programmed to provide sound effects and music in three voices. That said, programming it is not a trivial task, and no Dragon compatible software exists (that I am aware of) to make it easier. However, for the brave and the bold, the manual supplied is comprehensive. Simply using the programmed-in speech is easy enough, however. The unit contains 2K of ram buffer so speech and sounds can proceed without stopping the rest of the computer's activity. The speech provided by this unit is of high quality. Not perhaps as good as the digitised sounds from today's generation of machines, but perfectly understandable and usable. If you, like me, bought the software *Computavoice* and were disappointed, rest assured, this unit is far superior. One point: this unit does not appear to work with the Dragon 32 via a Multi-pak interface. I don't know why. Incidentally, CoCo OS-9 users with a Multi-pak and speech should cartridge, interested in computer music (there must be someone else) should get a copy of *Pan* — a music composer program — this is highly recommended.

JCB systems produced a speech-sound unit for the D32, but I've never seen it, so can't comment.

Orchestra90. This unit is really only of interest to CoCo owners. It is strictly speaking possible to operate it from the Dragon, but the unit reads the keyboard directly, so you need to work out a key assignment chart. Also, the more sophisticated functions of disc and RS232 I/O are only available to the CoCo user. For the record, the unit provides 5-voice two channel music synthesis to high quality, and, via a multi-pak, will save/load disc files, and down/upload from bulletin boards. Users are invited to contact me to exchange music

Dragon's Claw. Lucidata introduced this unit which emulated the BBC user port. Relatively cheap, and piggy-backed the DOS cartridge, it appeared quite useful. However, the digitising camera that was advertised for use with this seemed expensive and of poor resolution. It is also the case that the user port is not especially well-supported on the Beeb.

Kits. There are three Dragon-specific kits available from Maplin, and several Dragon-related projects were published in electronics magazines.

Extendiport. This has to be the simplest construction project. The complete novice (hello!) can complete this satisfactorily.

The unit is simply a small pcb that takes the connector to the cartridge port a few inches away from the computer case and rotates it through 90 degrees.

Modem interface. Perhaps the next move might be to attempt this device. It is rather more complicated. The completed kit will allow the D32 user to connect to a modem. At about £14, it is much cheaper than any competition, and still available.

I/O port. Build a device which will allow you to drive a number of relays from the computer. You could then use the relays to control a model railway, switch house lighting on and off according to a program (eg while you were away on holiday), create a timeswitch for your hifi/video recorder.

Building a project from plans published in a magazine is a more difficult enterprise than putting together a kit.

Hard disc.

Small (5 or 10 Mbyte) hard discs are being unloaded cheaply. When used under OS-9, a hard disc really lets loose the power of the operating system. The 64K memory restriction is easily overcome by the vast storage space online. A hard disc can be straightforwardly connected to a Dragon, although not recommended for do-it-yourselfers unless experienced. Interfacing and connecting the hard disc controller and drive is simple enough — wiring it into the circuit board however is tricky. I hope to be able to write on that in more detail in the future.

Display device. Computers are often compared by Joe Public on the basis of the display device — the number of colours, graphic resolution and speed are subjectively compared. The new generation of machines have 'pretty' graphic interfaces, and custom chips to enhance the speed, resolution and colours in graphic dislays.

The display device in the Dragon has always been a weak point — the 32 by 16, upper case only, 'window' (blank border around the active screen) looked dated when it was introduced, never mind since.

Compusense still sell the Dragonplus. In addition to the ram, it provides an 80-column full screen display. However, I understand that it is monochrome only; I do not know whether high resolutuion graphics are supported through it.

It would be desirable, don't you agree, if a modern, multi-colour display device offering all that is expected nowadays — upper and lower case, 80 columns or more by 25 or more lines, redefinable characters, multicolours and high resolution graphics, could be developed at a realistic price.

Dragonsoft

often appear in the same places in different games which means that after having played the game for a few weeks a person with a good memory could be able to complete it from the start without the opponent getting a try.

The game is for 1 to 4 players, although it is not very interesting for only one. For more players it is a good game. First you choose two squares to uncover the objects beneath. I liked the fact that either the number or the letter could be entered first. If a square has already been uncovered you are told that it is a void move and a selection out of range is ignored, allowing you another choice. If the objects match you are allowed two more squares until you fail to match when it is the next player's turn.

On a successful match, you are greeted with a quick burst of *Raindrops Keep Falling On My Head*, and more at the end of the game. If two or more players tie for first place then the game is declared a draw as there is no clear winner. To sum up this is a game which is simply but attractively done and I appreciated the little touches of humour in the descriptions of some of the objects.

I would have preferred more choice in the degree of difficulty with a least one other in between these two. My eldest son who is a zap-em freak actually enjoys playing this game so nobody should write it off as not being their type of game. There is certainly a shortage lately of any kind of educational software and more, similar programs should be encouraged.

When my Dragon was a pup we had superior educational programs even to the 'dare-I-say-it' BBC. The label states that this program will run on Dragon 32/64 or Tandy Coco 32K but I have only run it on the Dragon (both 64 and 32).

Mike Stott

No herrings in this pyramid

Program: *Pyradventure — Amenophis III*
Supplier: Dragonfire Services
Price: £3.00 cassette plus 50p P&P

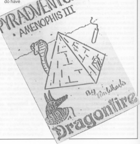
FROM the start I had problems with this adventure but not of the usual type. I was unable to load it so I found Andrew Hill's telephone number and he apologised and sent out another copy immediately. As this one also failed to load I tried a different approach and borrowed a Dragon 32 as I own a 64. Lo and behold both copies loaded first time complete with 'real speech', which turned out to be a recorded message on the tape played back during loading, very difficult to understand and also at a different level from the program so that you end up turning the volume up and then down.

When it is loaded you are told that you have to find the Mask of Amenophis 111 and return it to the starting point with other treasure that you will find on your travels. Directions cannot be input as a single letter and I think that this detracts from the enjoyment of the game. However, this is more than made up for by the plot and the challenges which you encounter on your travels.

I liked especially the little touch of no deaths or serious damage caused despite your attempts at violence. I do not like adventures which are made too complex by requiring completely illogical actions in order to complete them. This one is certainly not like that, although you do have to think hard about what use certain items have.

One of the tools that you require is in a seemingly illogical place but a clue is given to the hideout by an action you have to take in progress inside the pyramid itself. You are limited to the number of items you can carry so thought has to be given as to what item will be needed where. The cave complex is very difficult as mapping helps you to get in to find the objects, but then you seem to be in a different location when you try to retrace your steps, although it is quite possible to get out if you persist.

I nearly missed one of the items in the caves as I



Continued from previous page

appeared to be wandering aimlessly but carried on and suddenly came upon a different description to my surroundings which led me to a very important item. There are no 'red herrings' in this adventure and everything has its use. Take note also of the loading of the screen as there is at least one clue there.

All in all I really enjoyed it as will every adventurer, although it is slightly spoiled by having to type 'GO N' at least on every location change. I have since tried this adventure on a Dragon 32 that will not accept the speed poke and the machine crashed. I have contacted Andrew Hill to inform him of these problems and he assured me that they would soon have it working for all machines, so if you wish to buy it, please tell him what your machine is so that you can be sure of a working copy.

I wish programmers would not put in the speed poke without a question about whether your machine can handle it or not at the very beginning, as I will not use it and I know of others who will not use it at all. It also restricts the number of machines that can run their software. I think that this is Tim Wheals' first commercial adventure and it is not presented as well on screen as some of the others we have treated to, but I rate the actual adventure as one of the best I have come across, and well worth buying when the problems are sorted out.

Mike Stott

A handy new Boot

Program: *Orange Boot*
Supplier: Orange Software, The Garth, Star Road, Nant-y-Derry, Abergavenny, NP7 9DP.

THIS is a useful facility which will install a 'Boot' facility on a Dragon DOS disc. It will work on Dragon DOS VI.O, Superdos E6, Superdos V6, Dosplus V4, and Cumana DOS V2 at least, and may be discovered to work with other versions.

Although BOOT is a standard facility, the Dragon manual does not give any explanation on how to achieve it. Several methods have been published in various magazines, however, all contain their own peculiarities and idiosyncrancies to specific versions of Dragon DOS *Orange Boot* overcomes these.

Orange Boot will check that the necessary sector on the disc to accommodate the BOOT facility is not occupied by existing data, so it is possible to install a BOOT sector on an existing disk. This will only check for data that has been stored using standard SAVE or FWRITE commands. Discs that have had data stored on them using the SWRITE command should not be used unless that data is no longer required or the disc is reformatted. A new disc should be formatted with DSKINIT before using *Orange Boot*.

If a disc with *Orange Boot* is reformatted, the BOOT sector will be deleted. The program will, of course, also check to see if there is an existing BOOT sector on the disc and give you the option to overwrite it with a new version if you want to. It will also protect its own memory sector on the disc to prevent it being overwritten by normal SAVE or FWRITE commands, but it can be destroyed using the SWRITE command, so care should be taken with any program that uses this command. *Orange Boot* resides on track 0, sector 3 and will only reduce the total disc memory space by 256 bytes.

This may sound very complicated on paper but it is remarkably easy to use, as having done its checks the program will actually tell you that you cannot use the disc if the BOOT sector is occupied by data, when of course you must either move the data to another sector or reformat the disc, and then gives you the option to QUIT or restart with another.

The program also enables you to select one of up to four disc drives which again allows flexibility in use. It asks which file name you wish to BOOT and gives a sharp rebuke if you try not to, together with that familiar 'Sound 100' that program authors love so much!

Overall a very neat package and well worthwhile.

R L N Hewson

Done in a Klik

Program: *KLIK Utility*
Supplier: Harris Micro Software
Price: £14.95

NIGEL Mason ased if someone could do a review of *KLIK* for Basic42 by Harris Micro Software. Here is my rendition:

First there was *Basic42*, a hires screen driver, giving a 42 by 24 hires text screen, plus the ability to return to the Basic 32 by 16 text screen at will. On booting the disc, the system switches the D64 into 64K mode, copies the DOS and Basic from map0 to map1, loads the Basic42 into the spare 7.5K slot in the cartridge area (occupying only 4K, the remaining 3.5K being reserved for Basic42 utilities), leaving the full 23315K Basic area free for use.

The utilities available are *Spool* and *Typist*, which turn your Dragon into a typewriter and give it a printer buffer of 3.5K, allowing you to type and print at the same time. This was followed by *DOS Utility*, a permanent menu and window allowing use of DOS commands using the cursor keys to scroll up and down the menu. Then came *Icons*, which is a bit complicated, so that I haven't got right into it yet, and now there is *KLIK*!

KLIK is a multitasking simulator. Briefly, *KLIK* contains all the above utilities, but more up to date and enhanced, and allows full disc control via keyboard or joystick (preferred), using the keyboard only for inputs. Full use is made of pull down menus (there are nine of them). Each menu allows drive definition, window size and position, file type and direct commands (either Basic, DOS, or Basic42). There are three menus with at least sixteen commands in each — without counting, about 60-plus are available, all at the touch of a joystick.

Menus available are main, edit, DOS, jotter, desktop, access, spool, camera and memo.

Edit allows full editing facilities and program run.

DOS is a disc management menu. A full disc requring PROTECT ON can be done one file at a time in less than five minutes, without touching the keyboard.

Desktop can be used to call up the next four accessories, or they can be called up on their own.

Memo is a set of note pads written by you and stored on disc for recall.

Spool saves a printed output to disc file for printing at a later time.

Camera saves a hires screen to disc file. I haven't tried this one yet.

Jotter is a one line word processor for jotting or writing articles to *Dragon User*. This was written using *Jotter*.

One other which is on the disc is *KBasic*: this allows you to write your own menus and windows for inclusion in your own programs.

As an example: power up; insert *KLIK* disc; type BOOT; use cursor keys to select MOUSE; enter, enter; now you are in the joystick mode.

From now on there is a non-destructive cursor under joystick control (use fire button for enter), Now select RUN or LOAD (run is better), press fire. You will now see a new type of DIR; lace cursor over the required ICON (or move to CONT at the bottom for further DIR), press fire. Your selected program/utility is loaded and run.

The above is a very brief description of *KLIK*, which must be used to be appreciated. My own opinion is that it was not produced early enough to keep Dragon interest going.

Full marks to Mr. Harris for the time and effort that has gone into all this. All I need now is a spreadsheet and full blown word processor on the same lines, hint! For all those who have not as yet purchased any of the above, do so. You need a '64 and disc drive/s.

One hint: Basic42 on its own can be used as a screen driver for your Basic program, just alter your print and locations to suit the 42 column screen. It does look a lot neater.

Mr. Harris can be found at Harris Micro Software, 49 Alexandra Road, Middlesex TW3 4HP. Tel. (01) 570 8335. He is very helpful.

F J Fisher

Expert's Arcade Arena

Write to 'The Expert' at Dragon User

STREWTH! What? No!, Surely not, I can't have missed the May deadline, not already. Huh!, that's what an illness does for you! Anyway, having recovered from the code in my dose (infact it was more of a flu, but I had to get the joke in!), my absence has paved the way for an oversized bumper column.

Yes, I asked for it, I got it. Written exclusively for my readers of *Dragon User*, I'm proud to present to you Paul Burgin's *Chuckie Egg* screen designer. After the competitive chaos of the last high score, it certainly proves that the old farmyard is very much alive. Thanks P.B. Unfortunately, though, that's just the good news. The bad news is that it's fairly lengthy, so I've split it into two parts and you'll have to wait until the next column for the instructions, user's guide and the rest of the program data. For the time being, just try to keep the coffee mugs away from part one. This is the first time that I've featured a program like this in the Arena, so don't forget to write and send me your comments.

Next, this month ...... *Chess*. No, no, please, don't turn over, you are on the right page. You see, if you'll let me, I'll explain. I know *Chess* isn't strictly an arcade game, but, avoiding any insult to Hercules' brother in the office next door, it's not exactly his department either.

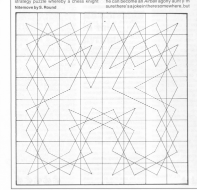
What I've got for you is a map showing the solution to the centuries old challenge known as *The Knight's Tour*. This is a strategy puzzle whereby a chess knight must start on any square on a chessboard and be moved, sequentially, to every other square, but must not visit any space twice.

Anyway, if you cast your minds back to May 1985, you'll find that *Dragon User* printed a Dragon version of this puzzle, by Pat McCabe and Colin Turner. It's actually my favourite game which has been printed in DU, so I was rather pleased when S. Round (I hope this isn't the start of the return of the Phantom Name Snatcher!!) sent me this cleverly presented solution. Apart from being a good cheat, it's also one of those things that a lot of people have just always wanted to know, anyway.

He/she/it (what's it matter?) says that all you do is find the corresponding square to the cursor position and follow the line in any direction. The line then points to all the squares you need to visit to finish the game — and it certainly works.

Now then, I'll give you the *Airball* help that I promised you, rain or shine, for last month. (It's lucky that I didn't mention any other types of weather). The first letter comes from some gent who's got his crawling head firmly screwed on and begins, "Having read your column with the greatest interest ever since it began". Shucks, thanks, but take note Nicholas Iforgottowritemysurname, flattery will get you everywhere (especially where I'm concerned). Anyway, shooting past the final houses and eventually reaching the point, he would like me to print his address so that he can become an *Airball* agony aunt (I'm sure there's a joke in there somewhere, but I can't quite think what it is). His humble abode can be contacted as follows: Nicholas, 38 Millicent Road, West Bridgford, Nottingham, NG2 7P2. Tel. (0602) 813352. That should keep him busy. He claims to have finished the game, using various cheat POKEs — Coo, a superhero, what can I say — and informs me that the final message is "Congratulations. The wizard is very pleased. He says 'Well done ball, I think I'll change you back to a human now"'. The ball then changes to a man who dances up and down with glee. Well, how naff!

Nitemove by S. Round



Airball Hint

To complete the screen which is SE, SE, SW, SW, SW, NW, SW (compass directions) from the start screen, you must create a set of steps using the blocks which can be found in the screen NE, SE from here. To place the blocks in their required positions, you must use a joystick. When a block has been collected, centre the joystick, then point it slightly towards the direction in which you wish to place the block — but not far enough for the ball to move. You can then press SPACE to place the block exactly where it is needed.

Actually, the more important reason for his letter was so that he could tell us all that if you use the lives POKE with the game, you have to sit at the computer for hours, killing off all your lives so that a crucifix appears at the start of your next game, and it becomes possible to finish. Well, he is in fact wrong. All you need to do is find the spellbook and drop it in the starting room. You then press "N" when the wizard offers you his challenge and you die. Next, you start another game (why is it that all games programmers believe in reincarnation?) and the crucifix will appear, as it always does, at your place of death.

Right, now to the solution to that other difficult screen, brought to you courtesy of Robert Hough and yours truly. Robert wrote to me to confirm that you do in fact solve it using the boxes which can be found in a nearby screen. Since this is how the whole world suspected that it could be done, but found it impossible, I loaded up the game and stuck with it until I eventually found the answer. I discovered that the reason why only half of the Dragon community could do the screen, when everyone else had no problems at all, is that the screen is impossible using the keyboard. A suitably vicious shooting party has been despatched to find Ed Scio.

By the way, don't worry Nick Hodge, I never read the inferior adventure column! Well, since the end of the column is approaching rapidly, I'd better sign off. Don't miss next month, when I will, of course, be presenting the final part of the *Chuckie Egg* screen designer and I may just have space to squeeze in the secret code for *Rolla-Ball*, which has just come in.

HEXLOADER

```
10 REM
20 REM HEXLOADER WITH WEIGHTED
30 REM CHECKSUM. ENTER THE START
40 REM ADDRESS FIRSTLY, THEN EACH
50 REM LINE OF HEX DATA FOLLOWED
60 REM BY THE CHECKSUM.
70 REM
80 CLS:PCLEAR1:CLEAR200,6789
90 INPUT"ENTER START ADDRESS";S
100 PRINTS;:T=0:W=1:LINEINPUT":";I$
110 FORG=1TO22 STEP2
120 V=VAL("&H"+MID$(I$,G,2))
130 T=T+(V*W):POKE(W+S)-1,V
140 W=W+1:NEXT
150 INPUT" =";C$
160 IF VAL("&H"+C$)<>T THEN SOUND20,5:PR
INT"ERROR - ENTER DATA AGAIN":GOTO 100
170 S=S+11:IFS<>8065 AND S<>15690 AND S<
>32511 THEN 100
```

LISTING 1

```
 7680 :B61F7381082570CCBD7EB7 =2235
 7691 :416EF752F18E7790BF52F2 =2965
 7702 :8E7F00863CA7808C7F5925 =1A22
 7713 :F98E5E9E108E1E32A6A027 =1970
 7724 :04A78020F8393A40434855 =15E8
 7735 :434B494540454747405550 =12D1
 7746 :4752414445404259405041 =1258
 7757 :554C4042555247494E403A =123F
 7768 :4053454C454354404940 4C =1271
 7779 :4052405340544404F524045 =12B9
 7790 :40544F404544495400 8E6A =147F
 7801 :677C1F73108E03006F8031 =1243
 7812 :3F26FA10BE1F77BE1F79EC =214F
 7823 :81B71F76F71F75EC81A7A9 =2696
 7834 :00C9C1142502C613F71F74 =19CD
 7845 :E7A900CBA680A7A900CAC6 =25E2
 7856 :0A31A900BFA680A7A05A26 =1D84
 7867 :F97D1F76102700207A1F76 =10F4
 7878 :A680C6203D108E6A671E12 =12CC
 7889 :308BE6A03AE6A08601A780 =219D
 7900 :5A26FB1E1220D97D1F7510 =1559
 7911 :2700277A1F75A601C6203D =1544
 7922 :108E6A671E12308BE6A13A =1B8E
 7933 :E6A06C846C846C016C0130 =1390
 7944 :88205A26F21E1220D2C618 =1980
 7955 :10BE1F7731A900A7A680A7 =1FEB
 7966 :A05A26F9312D3410C626A6 =192D
 7977 :80A7A05A26F93510F61F74 =1C75
 7988 :583A10BE1F77BF1F798E6A =1BE5
 7999 :CBA68084034848E680C403 =1CD7
 8010 :3404AAE04848E680C40334 =1C5A
 8021 :04AAE04848E680C4033404 =17D3
 8032 :AAE0A7A08C6D6726D731A8 =20DB
 8043 :4B10BF1F777E1E00000000 =93D
 8054 :0070003C1041494E223A81 =1116
```

LISTING 2

```
15360 :8E6F0E308900F25A2AF910 =1A55
15371 :9E299F1B86646FA04A26FB =1F17
15382 :A6845F48594859E7A05F48 =1D6D
15393 :594859E7A05F48594859E7 =1F99
15404 :A0A6808403A7A0109C9D25 =1B8A
15415 :DE9E29200910DE21BD8018 =1769
15426 :7E3D29108E3D537F3D44A6 =1813
15437 :8481012704810326 3C7C3D =1017
15448 :441F1093293404C41FE721 =16C7
15459 :3504584958495849A7A16F =1B75
15470 :A4A684810327014FA7806C =187B
15481 :A41F109329C41F270CA684 =1768
15492 :810127E9810327E520026D =154F
15503 :826DA06D809C9D1025FFB2 =22CC
15514 :9E297F3D45A68481022704 =1206
15525 :810326427C3D451F109329 =10C7
15536 :3404C41FE7A03504584958 =1694
15547 :495849A7A06FA434106F84 =1AD6
15558 :6F013088206CA49C9D2416 =1784
15569 :A6848102260CA601810227 =F1B
15580 :E7810327E32004810327F0 =17D2
15591 :6DA035106D809C9D25AE9E =1FBC
15602 :1B308900A7C618A680A7A0 =21BB
15613 :5A26F9109F1BC60A108E3D =1603
15624 :49A680A7A05A26F9EC81B7 =28F2
15635 :3D46A680FD3D47109E1BEE =1E61
15646 :81EFA14A26F98E3C575F39 =1AF8
15657 :867EB701678E4100BF0168 =1602
15668 :8E6A679F298E6D679F9DBD =233F
15679 :41007E4100FF00FF00FF00 =1AA7
```

LISTING 3

```
30608 :814C1027070C81531027D9 =13D8
30619 :548154260FB677AEF652D5 =252B
30630 :F777AEB752D520017D8145 =1AB1
30641 :1026DB420D761026DB3CB6 =1A77
30652 :FF2384F7B7FF237C5195B6 =258C
30663 :519581042605860 1B75195 =179C
30674 :8657971B7F4AA3BD5CF204 =1ED5
30685 :020006FF0F2BBD7A868E7C =1DEE
30696 :10BD5182BD5CF24F4B4040 =1B57
30707 :40404040404040404040FF =18B5
30718 :0F190F1A0F698E6ACBBD7A =1E8C
30729 :2D6D809C9D26F78E6BF79F =285B
30740 :35A684971D9E35C606E184 =1FFD
30751 :2602D61DE784BD7A2D9E8A =2165
30762 :BF0112BE01128C00062512 =AA2
30773 :B601518A02B70151B60159 =14F9
30784 :8A02B7015920D20D192704 =DED
30795 :961B200CBD80064D27D881 =19F9
30806 :2F2602961C8E78C85FA180 =1F62
30817 :27095C6D816D8426F520C1 =1F08
30828 :34040D1927060F190C6920 =8C5
30839 :02971C1E129E35D61DE784 =1DE4
30850 :BD7A2D1E1235020D1A2706 =770
30861 :810322020C198113252DC1 =1140
30872 :071027FF7C108C6D531027 =13D8
30883 :FF74108C6D541027FF6CC1 =1F82
```

Pamcodes

*Part six of **Pam D'Arcy's** introduction to machine code*

"LOOK out, you may have to wrap it up", says the editor, so I am writing this in a wrapped-up frame of mind. I mentioned last month that there has been an absence of feedback — now, I thought, that I may not be able to answer them in the column, I bet I will be swamped with them! Seriously, though, I will attempt to help anyone approaching me in writing with machine code problems if accompanied by loose postage stamps for the reply — though response time may be slow as, to be honest, I am currently getting to grips with a 16-bit machine.

My initial plan for this series was to enable absolute beginners to learn enough about the basic assembler instructions to be able to dry run code — that is, put yourself in the place of the computer and work through the program, seeing the effect that instructions being executed have on registers and memory, and so being able to spot misprints in listings and being able to put it right/adapt code to suit your own needs. Having written the first drafts of the sections on indirect addressing and positive and negative numbers, it is patently obvious that I am not going to get anywhere near my target of completing the basic grounding for you in two pages so feel that the best course to take is to try and present those two sections as completely as I can for now.

Indirect addressing

I have covered the other modes of addressing (extended, indexed, direct) previously, intending to defer indirect until a good example arose for building on. Instead, I have come up with an artificial example. Indirect addressing can be spotted in source listings because the operand, in Motorola notation, is enclosed within square brackets — both easier for the user in that the symbols are marked on the keyboard and for editing in that Dream uses shift plus arrows for editing functions. Thus this is an area to look out for when entering listings from books and magazines. I will use the Dream conventions of round brackets to denote indirect addressing.

Trying to find an analogy, I suppose indirect addressing is rather like posting a letter. You post it in a local post box — but that is not the letter's intended final destination, which is written on the envelope. Thus the address arrived at from the operand (postbox) is not the address of the byte(s) for the load/store/compare, etc but contains a further address (on the envelope) detailing the intended destination.

So, if:

memory address	contents
$6000	$70
6001	00
6002	23
7000	41 ("A")
7001	42 ("B")
4142	00
0023	43 ("C")

LDX $6000 (=extended addressing) copies contents of $6000=value into register x
LDA ,X (=indexed addressing) copies contents of $7000=$41 ("A") into register A

(Obviously, in this example, LDA $7000 would arrive at the same answer, but we will asssume that the contents of $6000 contains an address that is changed during processing — such as may occur when sorting data into alphabetical sequence).

Indirect addressing avoids the need to set up the intermediary register in this sequence:

LDA ($6000) Get the (envelope) address ($7000) from the operand (postbox) address ($6000) and copy into register A the value at that (envelope) address ($41 — "A").

The operand contained in the brackets may take any of these indexed forms covered previously. Indexed addressing may not be encountered very often but beware when it is present for mistakes can arise as easily as omitting the hash symbol from an immediate operand. For instance,

LDX $6000 is very different from LDX #$6000

```
.                      .
.                      .
.                      .
LDA      (,X)          LDA      (,X)
```

as the first example treats the contents of register X ($7000) as the postbox pointing to an (envelope) address of $4142 — resulting in the null ($00) from $4142 being copied into register A whereas the second example loads the actual number $6000 into register x=the postbox containing the (envelope) address $7000 etc as required.

Note also that any indexing applied to a register within the brackets is used to calculate the initial (postbox) address and does not index the final (envelope) address. That is, the letter "B" in location $7001 cannot be picked up by

```
LDX £$6000
.
.
.
LDA (1,X)
```

Using the values allocated to this example above, this would result in a (postbox) address of $6001, leading to a destination (envelope) address of $0023 — resulting in the letter "C" ($43) being copied into register A.

I now have a quick, though not too practical, example of using indirect addressing. I shall set up a string variable in Basic, pass its address to an assembler routine that will alter its content, return to Basic and print out the amended string. Type in and assemble **listing one** (but don't yet run as it requires a parameter to be set up in location 'ADDR'). Type in the Basic program **listing two**. Running the Basic program will result in the string being changed from " HERE" to " THERE". A few words of explanation may be helpful (particulaarly considering the number of errors I made in getting this tiny, meaningless example to work!).

a) VARPTR places the address of the 5-byte string descriptor of V$ in variable V. The first byte of this area contains the length of the string and the third and fourth bytes contain the actual memory address of the string data

b) The string (='envelope') address is copied (PEEKed/POKEd)into the parameter area (='postbox')of the assembler routine

c) The assembler routine overwrites the space character at the beginning of the string with a letter 'T' using indirect addressing (ADDR,PC='postbox';contents ='envelope'=destination address)

d) A final comment concerning the way that the variable V$ has been set up: try running the program with line 30 as I initially had it:

```
30 V$ = " HERE "
```

LIST it,RUN then LIST it again. Do you see the problem?

I have suggested previously that the article *Finding out what Dragon memory has in store* by Rodney Jones, as published in the August 1983 issue, be reprinted. (*We'll see what we can do — Ed.*) It is the only one of its nature that I have ever seen appear in *Dragon User* and I have never got round to expanding it. The article details the layout of a Basic program in memory — and from it I learned what I forgot when first writing those few lines of **listing two** — the efficient Basic interpreter will associate a string variable with the address of a present string within the program area rather than unnecessarily taking up string variables stack space — hence the amending of actual program line 30 to V$="THERE"! By manipulating the string content, the new string is stored on the string variables stack and hence the program content remains unchanged!

Positive and negative

To the computer a byte is just that — a byte, containing 8 signals. The Dragon (32s and 64s) contain 65536 8-bit bytes (or locations or memory addresses) each contaning a value at any one time of 0-255 (sum of

Figure one

Most signigicant end — least significant end

7	6	5	4	3	2	1	0	bit number in byte
128	64	32	16	8	4	2	1	decimal value if bit set on = 1
8	4	2	1	8	4	2	1	hex representation

decimal representations of on bits). The 32s and 64s in 32K mode have all these memory locations accessible — it is just that the location above address 32767 can only be read, not written to (Read Only Memory = ROM). Most values, often in conjunction with up to the next four adjacent memory bytes, represent a legitimate machine code instruction, so, as suggested in previous articles, if we direct the computer to any address in its memory,it will attempt to obey the content of the bytes it encounters as if they were legitimate program instructions.

However, it is we who are the wizards — the computer merely obeys our commands — and to us, supported by the instruction set, the value in a byte can be many things depending on circumstances. Take a byte with bits 0,1,2,3 and 6 set. This is hex value $4F, or, in decimal, 79. If it is part of our program, it would be the computer instruction

```
CLRA
```

(CLeaR register A — set all its bits=0). If it was a byte within a message that we were displaying on the screen, it would be the capital letter O. We could also be using it in the fashion of the CCR with individual bits being set or otherwise representing individual conditions within our program.

Numeric values can have a further dimension. A byte can contain a decimal value of up to 255. What, however, about negative numbers? This is achieved by using the most significant bit of the byte, bit 7, as a sign bit:

0 = positive number
1 = negative number

Because of a bit being used to indicate the sign, only seven bits of the byte remain for representing the value approximately halving the possible maximum value (the bit representing decimal 128 is now the sign bit), which is where the range +127 to -128 comes in. The only other slight complication is that although 1 positive is just bit 0 of a byte set, 1 negative is NOT bit 7 and bit 0 set, as negative numbers are held in a form known as twos complement. The bit pattern for a negative value can be ascertained by subtracting the value from 256, for example, -1=256-1=255 or $FF. The contents of registers A and B and single memory bytes can be reversed from positive to negative and vice-versa using the NEGate instruction (note the difference from the COMplement instruction that simply reverses the state of the bit pattern, so that a value of $FF (-1) NEGated would give $01 (+1) whereas a value of $FF COMplemented would give $00 (all bit settings reversed). The latter may be seen described as ones complement as different from the twos complement format of positive and negative numbers.

As far as the machine code instructions are concerned, values in a byte are what they mean to us in our program at that time. For instance,if a byte contains $50, it may be regarded in context as:

- — an unsigned decimal value of 80
- — a signed decimal value of +80
- — the ascii character P
- — bits 4 and 6 of a byte set

If the value exceeded $7F, that is, bit 7 is set, there is no normal ascii value that is associated with it,but again, the contents of the byte can have a number of different meanings according to the context, for instance:

- — an unsigned decimal value of 149
- — a signed decimal value of -107
- — bits 7,4,2,0 of a byte set

Double bytes are 16 bits wide and the decimal doubling progression continues to the left of the **figure one** sequence, bit 8 being 'worth' 256 etc., through to bit 15 being 'worth' 32768, with all 16 bits being set totalling 65535.

All unsigned values are regared as positive values; signed values are positive if bit 7 of a single byte (bit 15 of a double byte) is 0, negative if that bit is set to 1.

The important thing to watch out for in our programming is that we do not accidentally use signed rather than unsigned instruction and vice-versa. For instance, if clearing an area of memory, an efficient way of coding it would be to put a count in register A or B and use that as a register offset, DECA or DECB at loop end, looping back if still positive thus:

```
     LEAX MEM,PC
     LDA   #99  ,to clear 100 bytes
                 address MEM-MEM+99
LOOP CLR   A,X
     DECA
     BPL  LOOP
     RTS
MEM  RMB  100
```

An easy slip to make is using register offsets in particular and single byte counts when there is the possibility of sign bit interference. Offsets are regarded as being signed values (so may be in the range +0 to +127/-1 to -128 for single bytes; +0 to +32767/-1 to -32768 for double byte values,for example, register D offsets). If the area to be cleared is, say, 200 bytes long and a single register offset/count of 199 is set up, as the value has bit 7 set ($C7), the first address to be cleared will be seen to have a negative offset (+199= same bit pattern as for -57) with the result that the first CLR would actually clear memory address MEM-57 rather than MEM+199 and the loop will terminate immediately as the BPL conditional branch would fail first time round, bit 7 of register A being set (=negative).

The negative interference is something to watch out for if using the LEA instruction for arithmetic. Using a constant offset (eg LEAX 200,X) will not cause problems as the assembler will generate a positive, double-byte offset value. The problem is that if one is varying the increment value using register offests,one must be absolutely sure of the range of values one is dealing with and code appropriately (eg using double byte register D if a positive value)127 will never need to be added).

There is one method of adding a single byte positive value 0-255 to a register — the ABX instruction (add the unsigned=positively treated contents of register B to the contents of register X). It is difficult without decent examples isn't it!

I am sorry that this is a somewhat less than satisfactory article, but we contributors weren't at all sure what was to become of us at the time. I think we should all give thanks to Sunshine Publications for five years of *Dragon User* for our magnificent machine.

```
5001                    * LISTING 1
5001                    *
5001                    * INDIRECT (FILENAME)
5001                    *
5001                    * USING DREAM AFTER
5001                    *     CLEAR 200.&H5000
5001
5001
5001 160002                 LBRA   GO
5004 0000         ADDR      FDB    0
5006
5006 8654         GO        LDA    #'T'
500B A79CF9                 STA    (ADDR.PC)
500B 39                     RTS
500C
500C
```

```
10 REM LISTING 2
20 EA=&H5001:PARAM=EA+3
30 V$="HERE":V$="  "+V$
40 PRINT V$
50 V=VARPTR(V$)
60 POKE PARAM.PEEK(V+2)
70 POKE PARAM+1.PEEK(V+3)
80 EXEC EA
90 PRINT V$
100 END
```

Slowing it down

Ted Newman gets the Cumana directory under control

I HAVE a Cumuna DOS. Typing DIR from the keyboard lists details of every file on a given disc. The display runs at the rate of knots — so I only see details of the last few files.

Dragon can be halted by pressing keys shift@ at the keyboard. Pressing any key will get Dragon going again. Using this trick will stop the DIR display at the end of ten entries. But not even Wyatt Earp would have been quick enough on the draw.

Here is a utility which causes all printouts to run slowly. This allows the DIR display to be read as it runs. Shift@ can be used in a practical way. You have to keep the keys down until the display stops since the DOS will not let the poor keys get a look in until it has dealt with a batch of ten files. Push any key to continue the display on its way.

The utility is in fact general purpose. It can be turned on and off as needed either from the keyboard, from a Basic program or from a machine code program.

The utility is written in machine code. It can be loaded onto the disc by the loader. (**Listing 1**). The loader also loads the code into memory.

If you look at the loader you will see at the start of line 100 SAVE"YOURNAME". You can of course leave it like that! But the idea is that you substitute "YOURNAME" for any name you like. I use "SF".

If you have no disc but have a cassette then change SAVE to CSAVEM. If you haven't either then leave the line out. You've got the code into memory anyway.

Having typed in the loader RUN it. If you have made no typing errors then after loading it will EXECute SF three times while giving, hopefully, some useful chat. Each time SF is EXECed it changes the state — from normal to slow or vice versa and indicates in which state printout has been left. Remember that each time you enter EXEC the state will change.

If you have made a mistake in typing in the loader program, DRAGON will probably tell you. If you have errors in the data lines then the screen will go red with rage! Hopefully it will also help you to track down errors.

Once installed SF is not easily removed but there is little point in removing it, since it uses very little memory. Because it is in m/c it does not interfere with Basic programs. Basic programs do interfere with each other, so there is an advantage in loading SF as m/c from disc or cassette. You will need to organise space for the m/c. Typing in:

CLEAR 200,&H7F90

and pressing ENTER will do.

No Basic program which has been previously loaded will be damaged, nor will be any m/c program provided it does not use memory above &H7F90. (That's hex for 32656).

I have set the delay to one I think suitable but if you are any good at POKEing about then once SF is installed you can alter the delay by entering, from the keyboard, POKE&H7FE4,N. N must lie between 0 and 255. N has been set to 25. Delay is proportional to N. Care is needed, for if the &H7FE4 is typed incorrectly all sorts of mayhem is possible! NOTE! NOTE!! If you are using **listings 2 or 4** the poke is &H7FC1,N. The listings are for a second version of SF which leaves out the state indicator. SLOW can then be turned on and off from a program without the indicator spoiling the effect. **Listing 2** shows the changes that have to be made to the loader. Line 20 has to be changed and so do the data lines. TS and BY are check sums. If you are lucky enough to have a Dragon 64 then after you have put it into the 64 mode you can put SF higher in memory. Change Line 10 in the loader to CLEAR 200,&HBF90:MS=&HBF91:CLS. For those who are famililar with m/c, **listings 3 and 4** are Assembler printouts (from DREAM) of the two versions of SF.

Some of you might like to know how SF works. In attempting to do this I'm probably on a hiding to nowt. Either you will know it all already or else it will be treble Dutch. But here it goes.

The Basic character out routine (CHAROUT) is in m/c. It contains a facility which enables one to insert extra program. SF makes use of this. It consists of three routines A, B and C.

C inserts into CHAROUT a small routine, A, that takes a long time ot run — it counts down a fairly large number to zero. Every time CHAROUT tries to print out a character it has to wait for the countdown.

Before I go any further I will explain how the insertion is arranged.

In order to understand how this is done you should first know that each operation performed by Dragon is specified by an instructional operation such as KICK DRAGON...This specifies an operation that the Dragon can suffer but not do!!!

Dragon programs consist of Statements which are usually arranged sequentially in memory and normally the operations follow this sequence. However Dragon provides operations that cause a jump out of sequence. Three of these — three of many — are relevant to the "hook in". These are m/c operations and are roughly equivalent to those specified by the Basic instructions GOTO (a line), GOSUB (a line) and RETURN, GOTO causes a simple jump. GOSUB also causes a simple jump, but, as well, it causes the storage of a pointer to the next place in sequence after the jump statement. RETURN causes a jump back to the last pointer. The three m/c statements could be given any names, say Tom, Dick and Harry. I'll call them JMP,JRS and RTS.

Listing one

```
10 CLEAR200,&H7F90:CLS
20 TS=10333:BY=105
30 PRINT"          I AM A LOADER.
40 MS=&H7F91:N=0:AD=MS:PRINT"PLEASE WAIT"
50 READX$:IF X$="##" THEN GOTO70
60 N=N+1:X=VAL("&H"+X$):POKE AD,X:AD=1+AD:S=X+S:GOTO50
70 T1=BY-N:T2=TS-S:IF T1<>0 THEN GOTO160
80 IF T2<>0 THEN PRINT"THERE ARE DATA ERRORS":GOTO180
90 PRINT"LOADING"
100 SAVE"YOURNAME",MS,MS+BY,MS
110 EXEC &H7F91:PRINT"      LOADING COMPLETE.NOTE THAT PRINTOUT IS SLOW."
120 PRINT"    YOU CAN RETURN TO NORMAL BY TYPING EXEC ON THE KEY BOARD
AND PRESSING ENTER."
130 PRINT"I SHALL DEMONSTRATE THIS.":GOSUB150:EXEC:PRINT"ACTUALLY I DID
THIS FROM MYSELF!"
140 GOSUB150:EXEC:PRINT"BACK TO SLOW NOW!GOODBYE!!!":END
150 FOR I=1TO3000:NEXT:RETURN
160 IF T1>0 THEN PRINT"TOO FEW ";:ELSE PRINT"TOO MANY ";
170 PRINT"DATA ITEMS"
180 PRINT"PLEASE CORRECT AND RERUN":SCREEN0,1:FOR I=0 TO 1000:NEXT:END
190 DATA 34,36,BD,BA,77,30,8C,48,31,8C
200 DATA 53,8C,1,68,27,19,B6,1,67,A7
210 DATA A0,86,7E,B7,1,67,FC,1,68,ED
220 DATA A4,BF,1,68,30,8C,3C,8D,13,20
230 DATA F,A6,A0,B7,1,67,EC,A4,FD,1
240 DATA 68,30,8C,2F,8D,2,35,B6,10,8E
250 DATA 4,E,EC,84,ED,A1,EC,2,ED,A4
260 DATA 31,A8,1E,10,8C,5,FF,2B,EF,39
270 DATA 34,10,8E,19,0,30,1F,8C,0,0
280 DATA 26,F9,35,10,39,39,39,53,4C,4F
290 DATA 57,46,41,53,54,##
```

Listing two

```
20 TS=5769:BY=62

190 DATA 34,36,30,8C,28,31,8C,33,BC,1
200 DATA 68,27,14,B6,1,67,A7,A0,86,7E
210 DATA B7,1,67,FC,1,68,ED,A4,BF,01
220 DATA 68,20,A,A6,A0,B7,1,67,EC,A4
230 DATA FD,1,68,35,B6,34,10,8E,19,0
240 DATA 30,1F,8C,0,0,26,F9,35,10,39
250 DATA 39,39,##
```

```
7F91 7F91         ORG   $7F91        7FC7 8D02               BSR   SR
7F91              PUT   $4E21        7FC9 35B6       ED      PULS  A,B,X,Y,PC
7F91 3436         PSHS  A,B,X,Y      7FCB 108E040E   SR      LDY   ##040E
7F93 BDBA77       JSR   $BA77        7FCF EC84       L2      LDD   ,X
7F96 308C48       LEAX  PROGA,PCR    7FD1 EDA1               STD   ,Y++
7F99 318C53       LEAY  PROGB,PCR    7FD3 EC02               LDD   2,X
7F9C BC0168       CMPX  $0168        7FD5 EDA4               STD   ,Y
7F9F 2719         BEQ   NP           7FD7 31A81E             LEAY  30,Y
7FA1 B60167       LDA   $0167        7FDA 108C05FF           CMPY  #$5FF
7FA4 A7A0         STA   ,Y+          7FDE 2BEF               BMI   L2
7FA6 867E         LDA   #$7E         7FE0 39                 RTS
7FA8 B70167       STA   $0167        7FE1 3410       PROGA   PSHS  X
7FAB FC0168       LDD   $0168        7FE3 8E076C             LDX   #1900
7FAE EDA4         STD   ,Y           7FE6 301F       L3      LEAX  -1,X
7FB0 BF0168       STX   $0168        7FE8 8C0000             CMPX  #0
7FB3 308C3C       LEAX  W1,PCR       7FEB 26F9               BNE   L3
7FB6 8D13         BSR   SR           7FED 3510               PULS  X
7FB8 200F         BRA   ED           7FEF 39         PROGB   RTS
7FBA A6A0    NP   LDA   ,Y+          7FF0 39                 RTS
7FBC B70167       STA   $0167        7FF1 39                 RTS
7FBF ECA4         LDD   ,Y           7FF2 534C4F57   W1      FCC   /SLOW/
7FC1 FD0168       STD   $0168        7FF6 46415354   W2      FCC   /FAST/
7FC4 308C2F       LEAX  W2,PCR       7FFA
```

You should know that each Dragon memory unit can takeup 256 states. This much is called a byte. It can code any whole number from 0 to 255. A pair of bytes can store any number from 0 to just over 65000. If the bytes are N1,N2 then the number is:

256*N1+N2.

JMP, JSR and RTS differ from their Basic counterparts in that they jump to a memory address rather than to a line. The JMP and JSR statements each use three bytes. The last two bytes specify the memory location to be jumped to. RTS only uses one byte.

Dragon not amused

Dragon puts aside three memory locations, 359, 360, 361 (sometimes called a hook) especially for the purpose of hooking code into CHAROUT. CHAROUT contains the instruction JSR 359 so it jumps to the hook. CHAROUT expects a return (RTS) and if it doesn't get it Dragon is liable to get very cross.

359, 360, 361 are RAM and so any byte values can be poked into them.

SF's C routine, to cause SLOW, POKES in JMP (to SF's A), and unPOKEs it to return to normal. SF's B routine is at the end of A. It could be just RTS and so cause a return to CHAROUT. Well it's not so easy as that. I never is!

The question is...what was in the hook before?

It's always a good idea to have a look. By entering:

FOR I=359 TO 361:?PEEK(I):NEXT

You can do just that.

If you switch on a Dragon with no extras you will get 57,57,57. Now 57 is RTS and it returns control straight back to CHAROUT. Obviously only the first 57 is needed. The others are ignored. If you are fitted with a Cumuna DOS the numbers will be 126,194,80. On first switch on Dragon had put in 57,57.57 but the DOS immediately poked in 126,194,80.

126 is JMP. The 194,80 specify where Dragon is to jump to. The two numbers are treated as pair. The location is 194 times 256 plus 80. That is 49744.

So now you know that Cumuna DOS has a routine starting at address 49744. If you think about it a disc WRITE is a sort of print-out. If you get rid of the DOSes pokes all disc WRITES become READs. This makes it hard to corrupt the disc but it's not what you want.

If you have a Dragon DOS the numbers will be 126,216,250. I'll leave you to work out where Dragon DOS starts it's CHAROUT fiddle.

Back on the hook

Before pokeing in the jump to SLOW, C must put what was in the hook to the end of A. To return to normal C must return to the hook its original contents.

To sum up. When C is EXECuted, it looks to see if the JMP (to A) is in the hook. If this is not so then the contents of the hook are put on the end of A. C can now put JMP (to A) into the hook. That installs A. But if A is installed then C pokes back the original contents of the hook. This returns speed to normal. If you now look at the assembler listings you might expect to recognise some of the numbers. Well you would if you knew hex. $7E is 126, $39 is 57, $C250 is 49744. If you have a Cumuna DOS why is the end of A, B that is, 39, 39,39 and not 7E, JC2, 50? Well C hasn't been EXECed yet. When it has 7E, C2, 50 will be there.

I apologise for the treble Dutch. But please read Pam D'Arcy's articles on m/c.

Good hunting!

Listing four

```
7F91 7F91            ORG   $7F91        7FB2 A6A0    NP      LDA   ,Y+
7F91                 PUT   $4E21        7FB4 B70167          STA   $0167
7F91 3436     STARTC PSHS  A,B,X,Y      7FB7 ECA4            LDD   ,Y
7F93 308C28          LEAX  PROGA,PCR    7FB9 FD0168          STD   $0168
7F96 318C33          LEAY  PROGB,PCR    7FBC 35B6    ENDC    PULS  A,B,X,Y,PC
7F99 BC0168          CMPX  $0168        7FBE 3410    PROGA   PSHS  X
7F9C 2714            BEQ   NP           7FC0 8E1900          LDX   #$1900
7F9E B60167          LDA   $0167        7FC3 301F    L3      LEAX  -1,X
7FA1 A7A0            STA   ,Y+          7FC5 8C0000          CMPX  #0
7FA3 867E            LDA   #$7E         7FC8 26F9            BNE   L3
7FA5 B70167          STA   $0167        7FCA 3510            PULS  X
7FA8 FC0168          LDD   $0168        7FCC 39      PROGB   RTS
7FAB EDA4            STD   ,Y           7FCD 39              RTS
7FAD BF0168          STX   $0168        7FCE 39              RTS
7FB0 200A            BRA   ENDC         7FCF
```

Ossett '88

Helen Armstrong shows up at the show

OSSETT Town Hall is as noble a pile as it appeared in last year's *Dragon User* photographs. This was my first visit to the popular Northern show site. Having survived kamikazi crosscountry navigation to avoid the five mile traffic jams specially laid on the by the Motorways authority for the bank holiday pleasure of M1 motorists, broken up a cat fight in Sheffield, dodged the local football gathering and arrived unscathed at Ossett, just south of Leeds, I found myself driving round and round what must be the world's shortest ring road, ever mindful of the little cupola at the apex which marked the position of the Town Hall as I tried to find the nearest car park.

Actually, the nearest car park, and the second nearest one, are just round the corner, the entrances well hidden.

Ossett is not so much a town with a Hall as a Town Hall with a town attached to it. Inside the Hall, as well as plenty of room for tables and exhibits, there is a pleasant bar serving every dainty from beer to tea and sandwiches, and plenty of chairs on which to sit and enjoy them.

As *Dragon User* had not committed itself to a stand, I was for the first time in history able to go right round the show and have a word with nearly everyone there, with the exception of Harry Whitehouse, who was scarpering just as I arrived. (Nothing personal; the day was wearing on and Harry wanted to get home to his tea.) So I never did find out whether he had brought and sold nine of his fabled new joysticks. This pleasure awaits us all. Gossip floated after him — is Harry in? Is he out? Will he come to the next show or won't he? "He'll be coming to the next one after today!" chuckled one party, indicating that trading had been good.

Talking heads

First inside the door was organiser John Penn. How many people had been in? We don't really count heads any more, said John. We count the money at the end of the day — then we can tell whether we'll be in a position to put on another show. That's how it goes. Plans are already bubbling for a show in London in the autumn, although the organisers agree that they will have to try and cut the overheads on the 6809 Show. "Too many things like fifteen darned fire extinguishers at eleven pounds apiece" (or was it eleven darned fire extnguishers at fifteen pounds apiece? No matter: the point is that 'extras' have a way of popping out of the woodwork at hotels and exhibition halls).

I was especially pleased to hear that Pam D'Arcy's *Formula One*, neatly packaged in a sealed plastic wrapper with full printed instructions, was sellling very well. Pam was sounding more optimistic about the chances of her tackling another game last time she wrote to *Dragon User*; perhaps this is the reason why.

In the meantime, I was accosted by a woeful David Makin, protesting that Gordon Lee (who reviewed *Picture Maker* in last month's DU) must have deleted something by mistake, because all the instructions were within the program — pages of them — and he hadn't even *mentioned* the *Magnify* function, which was one of the best bits. It's DU's policy to take instructions as we find them and see how adequate they are, but it does seem as if something was missing, and I promised to moot this with Gordon. David also mentioned that he doubted that he would be doing *Music Maker 2* now — the usual reasons: economic necessity, other calls on his working time, etc. He relented slightly and said that he might if he had a thousand advance orders. Where have we heard that before?

Next along, Johnathan Cartwright was demonstrating his recent release *Spy Against Spy*, available from Pulser Software, and a forthcoming release, *Utopia*, a tricky aerial shooting game, which he is still working on.

What about the rumoured *Rolaball* bug? I asked him. Yes, said Johnathan, there is a bug, and I've got it fixed now and will have copies of the new edition ready soon. But so far the only person who has come across it while playing the game is Mike Stott of NDUG! Yes, this ties up with the news coming into the DU office — there was a bug buried deep in the first edition of the game, but everyone who has played it and sent us a review has said what a good game it is. No worries. Bob Preston, who is selling *Rollaball*, says that he can't find it either.

The NDUG stand, manned by the aforementioned Mr. Stott, was running some of the Group's homebuilt software and selling circuit diagrams and various hardware project sheets, including instructions for converting the Dragon 32 into a Dragon 64. "Sold out" said Mike. No, said I, I don't want to buy one — I just wanted to see how much paper it covered. We had a project proposal for the conversion once, and it went on for pages.

People have sometimes asked me why DU has never published a conversion for the Dragon. This is mainly because cutting up your hardware is very much an At Your Own Risk affair, and we don't want to encourage people who aren't experienced constructors to go ahead and try it. Have you ever seen the amount of mail a reasonably complicated hardware project generated? I used to work on a hardware magazine, and I still have the nightmares.

NDUG, however, have the plans.

Mike escorted me eagerly over to meet Grahame Smith of Orange Software, complete with orange shirt (not as terrible as it sounds). This may have to do with the fact that Orange were showing several new games, as well as the new range of Quickbeam and other titles on disc, which have been licensed by Computape. "I've just got Harry to sign the contract", said Grahame, mopping his brow. The discs were selling well at the show prices, a little lower than the normal mail order cost. New games on cassette from Orange include *Lucifer's Kingdom*, which Mike trotted off with, *The Larkspur Trilogy Part 2: The Journey Home* and, intriguingly, *The Great Fish Van Scandal* (rumours that Mr. Van Scandal was in fact a Belgian DU reader were quickly scotched).

Preston plonker

Bob Preston of R & AJ Preston had his tables covered with diverse goodies as usual. Some of them were quite familiar. Is that a black Dragon t-shirt? No, alas, it is a black Dragon dust cover — not my size. I've been taken in like that before. Where did the dust covers and the supply of 1984 *Dragon Users* come from? From Harry Whitehouse, of course. As Dragon dealers rationalise, specialise and streamline, familiar stock lines pop up on new tables. Old Dragon gear never dies, it just finds a new home. As well as publishing new software, Bob specialises in sniffing out and resurrecting the old. He was looking quite pleased with himself, having come up from his home stamping ground in darkest Wales for the day. Would I like a plastic plonker? I don't care what your friends are made of, Bob — oh, I see. The Plonker is a tidy little toast rack for storing your discs in while you work. With a piece of strong sticky stuff to adhere it to the side of your monitor or printer. It's stout and scarlet, holds four discs upright (no more coffee mug accidents), and though I suspect it of having been invented with 3.5in and 3.25in discs in mind, it will take 5in discs quite happily. It will actually take more than four 5in discs, because you can get two to a slot without pushing too hard. I can't remember how much he said it cost, but it was a snip. Enquire next time you write to R&AJP.

I was also in the business of scrounging prizes for *Dragon User*. Sadly, I was forced to turn down an offer of Mr. Preston himself and George Cartwright, on the grounds that the two of them would be difficult and expensive to parcel out to ten winners, but carried away a bag full of the Dragon *Five Games Tape*, incorporating *Mublingly* (sic), *Cecil Plays 21*, *Roulette*, *Craps* and *Telepathy* for the 32/64. I hasten to say that this is available from R&AJP for those of you who are not in the habit of competing. Ah yes, reviews please — I wasn't bright enough to blag an extra one for *Dragonsoft*.

Pulser Software were representing the TRS-80 Group as well as themselves, and filled my arms with bundles of the group's magazine, in the hope that we would give it a plug and perhaps find something which *Dragon User* would like to reprint. I'd love to tell you all about it, but they were bumped from my bag this morning (every day is a balloon debate down here) in favour of getting the review tapes in the post. Never mind, soon come.

Boxes in, boxes out

By now, I had missed the tea bar and things were going back into boxes. I went and accosted our new guvnor, Bob Harris of Harris Micro Software, who had been as usual deep in conversation all afternoon over demonstrations of his staples *Basic42* and *KLIK Utility* (special price the two). He was looking pink and puffed after unpacking some of his kit over again to show to a late user, and not looking forward to the four hour trip back to London. I told him that we had finally acquired a review of *KLIK*. Bob, sternly determined not to appear to be influencing editorial policy, nevertheless could not forbare to ask what the chap thought of it. He liked it, sez I. Everyone I've asked who has tried it has liked it, so far. We just had no review, that was all. Somebody on holiday somewhere, we think. Printer wizard Bill MacGowan was also there, demonstrating the versatile *Printer Control* text and graphics processor, one of the versions of which was reviewed in DU last month, and some new fonts from Dragonfire Services are reviewed this month, so *Printer Control* is obviously continuing to be popular.

I caught up with Harry Massey of Computape as he shovelled the last of his stock into boxes. What has been going well? The Quickbeam games, he indicated, have been doing well, despite those terrible wrappers. What's so terrible about the wrappers? Well, compared to those games from Microdeal which came out at the same time ... *Airball*, *Wizards Quest* ... well, very true, Microdeal printed in full colour right to the bitter end, but they have the resources of a major software house. They have a bit more than a photocopier. And where are they now? As far as the Dragon is concerned, John Microdeal and David Quickbeam are *both* lining the leather armchairs of the great ex-Dragon-dealers club. But the fruits of their labours are still reaching the users, thanks to Harry and Verony.

Exit Ossett for another year. The show was being run on the same lines as most of John Penn's shows, semi-co-operative, so that the profits from the show benefit all the exhibitors and not just the promotors. This method minimises the risk of making serious losses, quite an incentive to those suppliers who have to travel half way across the country to attend. 'When are you going to hold a show in Leicester?' enquires one eager punter. 'You live in Leicester? That's just down the road, isn't it? Right, you organise it, we'll come!' says John cheerfully. Don't be too hopeful, Leicester. With the best will in the world, organising a show takes time, willpower and experience of the pitfalls, and determination and planning on the part of all the Dragon suppliers who carry it off on a regular basis.

Hopefully, this means that we can look forward to another show in the autumn, although the when and where have not yet been mooted. Thanks to everyone who attended, demonstrated or supplied at the show, and to Ossett Town Hall for being a pleasant site for one of the main Dragon social events of the year.

D'Arcy's Dragon Survey

IN the March issue of Dragon User, Pam D'Arcy asked Dragon owners to write to her and tell her about their systems and what they would like to see available for the Dragon, hoping that the information would be a help to her and other Dragon suppliers working in the market. Here are the results of her survey.

Analysis from 46 replies covering 71 users

	Dragon 32	64	128	Total
Basic cassette-only set-up	15	3	—	18
— plus printer (no discs)	9	4	—	13
— plus single disc drive	2	1	—	3
— plus twin disc drives	2	11	—	13
— plus printer and single drive	1	7	2	14
— plus printer and twin drives	1	11	2	14
— plus modem, printer and twin drives	—	2	—	2
Totals	**30**	**39**	**2**	**71**

AT the time of writing, 48 replies had been received, two of which were summaries for a dozen users each. One of those didn't mention printers, so I suspect that there are six to eight more printers to add to the 64s and twin drives alone figures.

Eight of the 64/128 owners summarised below also have 32s not mentioned as being used by other family members. Four of these 32s have printer/plotters attached in addition to a further printer on the 64/128. Details of two respondents are not included — a software company and a Tandy user.

Of 71 users, 33 (plus probably six to eight more) own printers. Of 40 disc users, 11 have single drives and 29 have twin drives. Disc drives are mainly 40T single sided units. Only half supplied details of the DOS in use (nine mention DragonDOS, eight DSuperDOS, two CumanaDOS and three DeltaDOS). Fifteen users mention having OS-9, four Flex and one Klik (it's user says it's super — available from Harris Micro Software). (*This was written before Pam knew that Bob was the new guv'nor! — Ed.*).

Software wants

Not surprisingly, 71 users provide about 100 different software requirements (some of which are already available!). Extracts are given below for those still in the Dragon software business. Thank you to all who have taken the time and trouble to write. To those who asked questions and haven't had a reply — either I don't know (try *Dragon Answers* or *Communication*) or I got cheesed off with the idea of paying return postage!

User wants

Menu driven desktop publishing software ... that interfaces with *Stylograph* ... or *Telewriter*; programs for file exchange between the different operating systems; a software NLQ mode utility; Flex white on black display; a decent handbook on DOS, particularly saving data; Tandy/Dragon machine code program converter; word processors; spreadsheets; CAD programs; public domain software; software able to be transferred to ROM; communications software; AI software; screen dumps; speech programs; typing tutor; conversions of other micros' software, eg Leaderboard type gold course designer; series games; football game where you control the players; motocycle racing and track designer/*Kick Start* type programs; disc 3D adventures; easy adventures; strategy games; good quality games at no more than £6 and able to be transferred to disc; good tape to disk utility; genealogical; astronomy; weather maps ... I'm keeping Adrian Parish's idea for a game under my hat at present!

MANY thanks to Pam for soliciting and collating that information, which should help to give Dragon users and suppliers who their fellow users are. If anyone has any further ideas about how popular 'wants' can be put into practice, send them in ... maybe the right person will see them and come up with a solution.

Basic09 in perspective

David Rothery *examines the virtues of 'the Basic that thinks it's Pascal'.*

THE microsoft Basic that comes with the Dragon is undoubtedly one of the best, and combined with Dragon's 6809 processor is also one of the fastest, so why change it? Some of the reasons may be:

— To get rid of the grotty text screen and use lower case
— To use the full 64K of the Dragon64 with discs
— To use a better disc operating system
— To have better editing facilities
— To have faster processing of repeated loops etc., especially in sorts
— To have a more structured Basic

The last point will interest those who envy those extra features on the Beeb (Sorry — I will wash my mouth out with soap), or who take their programming seriously and wish to learn good habits which will enable them to progress to more complex languages such as Pascal with a minimum of effort. Also if you think speed is no problem on the Dragon, look at, say, recent articles on printer dumps where one author claims that by careful structure his Basic program 'only takes two hours'. Phew! Some of my own programs sort a lot of name strings and weren't so bad while my machine was galloping along using the speed poke, but since all the Government Health Warnings against using it, perhaps I should alter them.

Basic42 from Harris has had good reviews in DU. It has an improved text screen, and works by adding to the existing Microsoft Basic. It enables structures like WHILE ... WEND to be used and also enables windows, pull-down menus and the like to be used. It will undoubtedly become more attractive as programs become available which make use of its featues. One problem which I found was its slow response to the keyboard.

The other way to improve screen display, disc handling etc. is to use Flex or OS-9. Both respond well to the keyboard, make use of the full 64K and have excellent screen displays. They both have a similar range of professional spreadsheets, word processors and record management systems, which produce files which can be manipulated by Basic. However, the commonly available Basics in these two systems use different approaches. DBasic in Flex is identical to the Dragon's Basic, except that it allows access to Flex's commands and disc files. Also it uses a different area for its disc commands and variable tables so that graphics saved as machine code files to not have to be loaded at a different address from their tape versions. Thus a game like *Tim Love's Cricket* can be loaded from tape into DBasic, saved to Flex disc and then runs unaltered, which is not possible with DragonDOS. If you want an improved display and file handling, but do not wish to alter existing programs too much, then DBasic is very good. It also has windows, but no structures. One nice feature is that if you program stops with a syntax error, DBasic lists the offending line with the error highlighted.

A TSC Basic also exists in Flex, which offers sophisticated file handling techniques, but lacks some of the Dragon's extended Basic commands, such as INKEY$, and has no graphics commands. However, it can save variables as a 'virtual array', and access them very quickly. Also the ON ERROR command allows resumption of the program at any point, including the line where the error occurred. A 'compiled' version of the program can be generated, which stores in less space. No EDIT command is available, and the error messages are simply numbers.

If you have (or are prepared to buy) the OS-9 system then you may like to consider the merits of Basic09. Since I think these are considerable I shall devote the rest of this article to it. Basic09 was developed along with OS-9 by Motorola, makers of the 6809 processor, to derive optimum benefit from its features. It is very fast, can manipulate OS-9 files and use all its commands from within a Basic program, but above all it enables highly structured programs to be written. Whereas the beginner can use normal techniques, including line numbering, it is possible to advance to programs which bear a distinct resemblance to Pascal.

To start with, many types of variable are possible, and these should be declared at the beginning of the program.

```
DIM name$
```

will define a real string variable just as in DragonBasic, although the name of the variable can contain more letters and may be in lower case. However,

```
DIM flag:INTEGER
```

means that flag can only have whole number values, and its use as a loop counter will not only save memory but increase speed tremendously. BUTE variables are integers in the range 0-255, and take half the memory of even INTEGER variables, and a fifth of that of REALs. BOOLEAN variables can have only two values, TRUE and FALSE and can be used in conjunction with a wide range of logical operators including the exclusive OR. This is called XOR, unlike the Beeb's EOR which always makes me think of A.A. Milne.

At the other end of the scale, arrays of several dimensions are possible and one can even define one's own complex data type. A special command enables a whole array to be copied at once into another array without the usual time-consuming loops. All this defaults to the normal Basic real variable if you want to ignore the rest.

The main reason why Basics are slow is because they are interpreted. Briefly, this means each command is looked up in a table and converted to machine code by the resident Basic interpreter every time, so a FOR...NEXT loop making a hundred loops will have to look up what to do a hundred times, and possibly evaluate the same formula that number of times. A compiled language will convert the whole program into object code, and save it in this form. If therefore runs very fast, but cannot be altered once it has been compiled. Thus you can try out each line of Basic almost as you enter it, and change it if it is wrong, whereas a faulty program in C has to be altered at source and recompiled. Basic09 manages to get the best of both worlds. As each line is entered it is checked for SN errors before being accepted, and then compiled to an I-code. Alterations may be made while it is in this form, and it will run while Basic09 is in memory using the command (yes, you've guessed it) RUN. In addition, by using the PACK command, another pass of the compiler is forced producing a code which is not only faster and more compact, but will run without Basic09 being present. A special smaller module caled RUNB is automatically called from the system disc whenever you type in the name of a Basic program, and this autoruns the program. However, packed programs cannot be edited, so the original should be saved. This also means commercial programs in packed form cannot be read or interfered with by the user.

The list of Basic words provided is comprehensive, and the only omission likely to worry the programmer is the lack on INKEY$. However, the manual provides a machine code source for this which, when assembled, can be called from the system disc when required. A wide variety of loops is possible, since we have WHILE and its associated ENDWHILE, LOOP and ENDLOOP, EXITIF, IF and ENDIF, as well as the usual FOR and NEXT. THis means that any tupe of loop can be constructed, including those with conditional jumps out. Loops can be nested to any depth, and the listings are 'pretty printed' to show the depth of loop as an indentation. When reading data lines the RESTORE command can have an associated line number. ON...GOSUB and ON...GOTO are both supported.

The biggest difference from Dragon Basic is in the use of procedures. The program may be (but doesn't have to be) split into self-contained procedures. Each can be called by name and can be loaded initially as part of the program or can be called from disc when required. This latter feature makes very large programs possible without regard to limitations of memory. Variables within a procedure are local, which means that the names used within the procedure can clash with those of other procedures without causing problems. Thus stock procedures for sorts, etc. can be kept in a library and used when required without alteration. Variables can be passed from one procedure to another by placing them in brackets after the procedure name. Even line numbers are local to the procedure. This high degree of structuring makes it possible to virtually eliminate the need for GOTOs (which will please the purists) and makes line numbers redundant, so they are in fact optional in Basic09.

The absence of line numbers means a different form of editor is required, and here comes my only reservation. I find the editor awful to use, since you can only move from line to line by using +n or -n, where N is the number of lines to move up or down. True, search strings can be entered, but these have a habit of finding words you do not want, since searching for OR would also find NOR and FOR. If you want to change a line, the only way of doing this is to specify a search string and a replacement string. This has the same problems, and you can end up with the wrong word changed. Also I find that under certain conditions the editor will fail to find the letters entered, even though they are there in the line. In that case, the only thing to do is delete the line and start again. However, because OS-9 files all have the same structure, there is nothing to stop you editing a Basic program using the *Stylograph* word processor and then reading it in to Basic09. The error checking is then delayed until the program is compiled, of course.

Another quirk of Basic09 is in the way it reserves memory. When first called it only reserves about 4K or space to work in. This can be expanded at any time up to the limits of your computer by using the MEM command. In practice, if you suddenly ask for about 13K of memory, it doesn't work. Fortunately, all you have to do is keep asking for a little more memory in small steps and it works fine. Also, am I the only person who finds it rude and irritating to be faced with WHAT? every time I make an error? Surely ERROR (*or PARDON? — Ed.*) would be just as succinct and more well-bred!

If you try to run a program with an error in it Basic09 automatically goes into DEBUG mode. This is quite powerful, and enables you to list or change variables, introduce breakpoints, step though the program line by line, list the order in which procedures have been called, etc. Of course, this is far better than the messy version of TRON in the original Dragon. Don't forget that all the normal OS-9 commands are accessible during DEBUG, or from the Basic program you have written. Thus a directory of files available can be read, or files can be copied, renamed, or even deleted. You could use Basic09 to create an index of all your discs simply by getting it to redirect the DIR command to output to a file you have created. Thus none of the versatility of OS-9 has been lost. You can also read files from Dynacalc or the Record Management System and manipulate them as you require.

The manual provided is quite good, but certainly not for beginners to Basic. The only concession to newcomers is a childish program near the beginning which shows you how to get the computer to say "Hello!". This section, entitled "What is a program", seems hardly necessary, as the person for whom it would be intended would then turn the page and immediately have a heart attack!

Graphics are not built into Basic09, but are possible by calling a special module, called gfx. Thus RUN GFX ("Line", x1, y1, x2, y2, colour) will enable a coloured line to be drawn between two points. Circles are supported, but the useful DRAW command of Dragon Basic is missing. If you have version 2 of OS-9 (formerly produced by Eurohard of Spain), a module called gfxe is supplied, which enables text and graphics to be freely intermixed — most useful for graphs, etc. A sample program called *Reloj* (Spanish for Clock) displays a clock which shows the correct time when the program is run. It will be evident that if you use these modules, which are specific to the Dragon, your Basic09 program will not be portable to other OS-9 systems on other computers.

The very simple program I include may be useful for setting up a printer before using *Stylograph* or RMS. Although for most Tandy printers (and some Seikoshas), it can be used for any by substituting the appropriate printer codes in lines 410 onwards. The first, line 410, should cancel all the other settings. After entering and saving as normal, use the PACK command to produce a compiled version and place it in your CMDS directory along with STYLO and RUNB. If you call 'Tandy</term' from your startup file, the printer set-up program will run and then load Stylo automatically at the end. Of course, you can CHAIN any program you want, or simply omit that line.

In the listing the left hand numbers are the I-code references used by Basic09. Although much will be familiar from Dragon Basic, the uses of ENDLOOP, ENDEXIT, ENDIF should be noted. Also, a printer path number should be DIMensioned but the actual number will be allocated by OS-9 and should not be specified by the programmer. Also the assignment of values to a variable can be done using x:=3 to distinguish it from the statement IF x=3 THEN ... This is optional, but good practice. In OS-9, CHR$(7) produces a warning beep and CHR$(12) clears the screen.

The program first asks if the printer needs to be reset. If the answer is 'no', it immediately loads Stylo. Otherwise it lists the printer styles possible. More than one of these may be selected before choosing option 10 to leave the program, so you can have double width and bold together if you wish. It is well to use option 1 first unless you have just switched on.

As usual, anyone having problems entering or using the program can give me a ring on Glossop 3912.

```
PROCEDURE tandy
 0000       REM ***********************************
 0025       REM ** Tandy printer set up program **
 004A       REM ***********************************
 006F 100   PRINT CHR$(12)
 0077       PRINT "DMP110  PRINTER SET UP"
 0091       PRINT
 0093       INPUT "Do  you wish to set/reset the printer (Y/N) ",q$
 00C7       IF q$="y" OR q$="Y" THEN GOTO 200
 00DF       ENDIF
 00E1       IF q$="n" OR q$="N" THEN GOTO 405
 00F9       ENDIF
 00FB       IF q$<>"y" THEN GOTO 100
 010B       ENDIF
 010D 200   PRINT " Please check the Printer is switched on"
 013C       INPUT " <ENTER to continue> ",q$
 0159       DIM printer path:BYTE; name:STRING[4]
 016B       name="/p"
 0174       OPEN #printer path,name:WRITE
 0180       DIM opt(9,2):STRING[50]; count,num:INTEGER
```

continued

```
019F     FOR x=1 TO 2
01B1       FOR count=1 TO 9
01C1         READ opt(count,x)
01CE       NEXT count
01D9     NEXT x
01E4     DATA "Reset/Initialise","Italic Style","Condensed Mode"
021B     DATA "Elite Mode","Enlarged Mode","Bold      "
0248     DATA "Underline","Prop Spacing","Microfont"
0273     DATA ".",".","137","96","40",".",".","96","136"
02A2 300 PRINT TAB(10); "OPTION"; TAB(30); "MAX COLUMNS"
02C5     PRINT
02C7     count:=1
02CE     LOOP
02D0       PRINT count; TAB(10); opt(count,1),opt(count,2)
02EB     EXITIF count>=9 THEN PRINT "10"; TAB(10); "EXIT FROM SETUP
         PROGRAM"
031A     ENDEXIT
031E       count:=count+1
0329     ENDLOOP
032D     PRINT
032F     PRINT
0331     INPUT "INPUT OPTION No. THEN ENTER TO PROCEED ",num
0360     IF num>10 OR num<1 THEN PRINT CHR$(7); CHR$(12);
037C       PRINT "INVALID OPTION NUMBER"
0395       PRINT
0397       PRINT
0399       GOTO 300
039D     ENDIF
039F     IF num=10 THEN GOTO 400
03AE     ENDIF
03B0     ON num GOSUB 410,420,430,440,450,460,470,480,490
03DB     PRINT CHR$(12)
03E0     PRINT
03E2     PRINT
03E4     PRINT
03E6     GOTO 300
03EA 400 REM END & LOAD STYLO
0400     CLOSE #printer path
0406 405 PRINT CHR$(12);
040F     CHAIN "/d0/cmds/stylo"
0421     END
0423 410 PRINT #printer_path,CHR$(14)+CHR$(27)+CHR$(15)+CHR$(20)+CHR$

           (27)+CHR$(18)+CHR$(27)+CHR$(32);
044D     RETURN
044F 420 PRINT #printer path,CHR$(27)+CHR$(66);
0461     RETURN
0463 430 PRINT #printer_path,CHR$(27)+CHR$(20);
0475     RETURN
0477 440 PRINT #printer_path,CHR$(27)+CHR$(23);
0489     RETURN
048B 450 PRINT #printer path,CHR$(27)+CHR$(14);
049D     RETURN
049F 460 PRINT #printer path,CHR$(27)+CHR$(31);
04B1     RETURN
04B3 470 PRINT #printer_path,CHR$(15);
04C1     RETURN
04C3 480 PRINT #printer_path,CHR$(27)+CHR$(17);
04D5     RETURN
04D7 490 PRINT #printer path,CHR$(19)+CHR$(27)+CHR$(77);
04ED     RETURN
```

Write: ADVENTURE

***Pete Gerrard** makes another breakaway bid from The Hobbit*

FROM programming last time to discussion this time! But don't worry, those of you who are working on embryonic adventures and are stuck halfway through, we'll get back to the programming side of things 'ere long. And first, the diatribe.

Why is it that so many adventure writers insist on populating their games with impersonations of characters out of *The Hobbit*? I've lost count of the number of spoofs that I've seen of that particular game, and not one of them manages to stick in the mind as being startlingly original or is remembered with any sort of affection. Many readers will probably disagree and will write to Helen in droves, but I much prefer seeing games and characters that are ORIGINAL.

We may laugh at watching Phil Cool perform his splendid impersonation of Rolf Harris or Billy Connolly, but seeing someone called Grandelf in a game is merely a poor substitute for the legendary Gandalf. Bored of the Rings (the book, that is) said it all, there is no need for people to go on producing endless variations on the same theme. If you can't think of something original then you shouldn't be writing adventures.

In the book world, for instance, a spoof on *The Hitch Hikers Guide to the Galaxy*might be well received the first time around, but if two, three, or even more, authors all produced similar works then they would have a hard time getting them published. Even if they were, the joke still begins to pall after the first time. If someone's already done a spoof on a particular topic then leave it well alone.

Having said all that, I would love to write an adventure featuring Floyd the robot, the wonderful android from Infocom's *Planetfall* and *Stationfall* — oh, pity the poor person who only has a Dragon and has never played these classics! Floyd the droid is an inspired piece of character creation, and like all good characters he comes equipped with his own catchphrase: "Floyd here now!" he shouts, as he barges into the room and nearly knocks you flying. Indeed, he seems much more realistic than the poor sap who is playing the adventure, i.e. you, because I got no real feel for my own character at all. Floyd, on the other hand, makes it all worth while.

The writers of the original adventure game tried to give some of their characters a personality by including lots of messages for each character. For instance, when trying to get past the troll bridge for the first time, many players will attempt to throw the axe at the troll. The response is something like: "The troll catches the axe and examines it carefully before throwing it back to you. 'Nice workmanship' he says, 'but not very valuable'." There we have not only a clue to the manner in which you must get past the troll (throwing him a treasure) but also a slice of his character as he gives the axe a careful scrutiny before throwing it back again.

Static characters, that is ones that remain in one location and don't follow you around, are perhaps the easiest of all for the programmer. Like the aforementioned troll, they are just there in the one location and are basically a puzzle that has to be solved before the player can progress. Making these puzzles original, however, is still a problem.

Such characters can have all sorts of prompts and messages being displayed, telling the player what they're doing, what they look like, what they're thinking, and so on. You could have a happy hippy troll listening to Steve Hillage tapes on his Sony Walkman, clicking his fingers and staring about him with a glazed expression. Perhaps you need to give him some fresh batteries for his Walkman, I don't know. The second time the player visits him he could have taken up breakdancing because he's put the wrong tape in, or he could be a dreadlocks troll with his shades on listening to Bob Marley tapes with his woolly hat bobbing up and down as he dances to an audible reggae beat. Simple ways of adding new life to an old situation.

Dwarfs, like our oft-mentioned friend Dimli Gloing, can be made to stand out from the crowd by giving them an immense liking for beer. In all his adventures, though, Dimli never gets drunk. That would be quite wrong, and totally out of character. He might like the stuff, and in an adventure game you could have a wonderful time with him constantly imploring you to take him to the pub (but not sitting down and singing about beer) and getting all huffy when you won't let him have a pint. But hands off, he's my character, and he goes in our adventures! Myself and Sandra Sharkey, ex-editor of *Adventure Probe*, are working on a series of games that will feature the majority of the characters under discussion here: Dimli, and the two coming up ...

Wizards, again like our own Strombrigner the Grey, can be made different by making them totally, but happily, inept. Once again though, in all the tales of Strombrigner and Dimli the wizard might get his spells wrong the first time, but everything sorts itself out in the end and he never causes any lasting harm to anyone other than the baddies. Well, he might damage his pride and cause grief to the leader of the wizards, Windbreaker, but that's about all.

A new character has been creeping into our adventures concerning the wizard and the dwarf. This is a little white rabbit, or wabbit, as he would pronounce it, and he is the emissary for the chappie that we've just mentioned, the leader of the wizards . The wabbit is based loosely on a person I know, and the first thing I heard him say was on a rainy day when he said "I hate this dweadful dweawy dwizzle" I am not making fun of people who have the unfortunate impediment of being unable to pronounce the letter 'r', any more than I'm getting at anyone who is dyslexic by having a wizard called Strombrigner. As the adventure progresses the wabbit has a very important role to play, and is a most powerful and influential figure.

And there we have three things that give each of these characters a more realistic flavour: Dimli likes his ale (can't think who he's based on ...), Strombrigner is inept, and the rabbit cannot pronounce the letter 'r'. This is brought to the fore in the adventure, with special messages for each character depending on the situation. A player might instruct the rabbit to climb a tree, in which case he'd get something like "Don't be widiculous. I'm a wabbit, I can't climb twees." The player might ask Strombrigner to catch something fragile as it plummets to the ground, and if he tried that then whatever it was would be more than likely to fall apart in his hands.

So, as with Floyd, we use simple, short messages to make the player really think that these characters exist, and are not just put there to make up a bit of scenery. They are real characters in real situations. Nor are they taken from *The Hobbit*!

We can see, then, how to go about giving your characters that little something extra that makes them stand out from the adventure crowd. But how do you go about thinking them up in the first place?

In this instance, Dimli was born in a conversation with a friend, who commented on a remark that something was 'dimly glowing'. A slight change of spelling, and the dwarf came into being. At that same moment a hundred and one relatives saw the light of day as well, such as Feebli Gloing, Bareli Glowing, and so on. Balin Hey followed shortly after Dimli, but he keeps himself in the background and we don't hear much about him. The rabbit, as I've said, was based on an acquaintance of mine, and the only decision to make was about what sort of animal he'd be. I wanted a talking animal who couldn't pronounce the letter 'r', so it was only natural that he should be something beginning with that very letter. As I wanted people to like him I couldn't really make him a wat, so a wabbit he became. The inept wizard was there before I could think of a name for him, and it was only whilst writing something totally unconnected with adventure games that the name Strombrigner came to mind. I was talking about the weather and describing someone as one of life's storm bringers, and then inspiration! Swop a few letters around, add 'the Grey' because I like Gandalf, and the character of the wizard followed on from that.

After creating the characters the adventure more or less wrote itself. Once the main story line had been thought through, problems and puzzles were devised almost exclusively on the characteristics of our three main protagonists. This meant that, happily, we weren't having to rely on other games for inspiration. In each of our adventures we're trying to push the art of adventuring, if you like, one step further every time. By having three such different characters we like to think that we've achieved it here. And the next game, slotted in after this first one and before the sequel? Well, that will have to wait for another article, because the characters in that are so different that we want to get the game finished before writing about them. When it is I'm looking forward to the ultimate compliment: somebody doing a spoof version of our game and our characters!

Pete
GERRARD'S
ADVENTURE
TRAIL

'Spring is sprung,
The grass is ris,
I wonder where the boidies is.'

Probably eaten by next door's dog, I shouldn't wonder, which has spent an unpleasant morning randomly assaulting passers-by in the form of postmen, men emptying dustbins, and chaps who have innocently come along to repair a washing machine. Things cannot go on this way, and one shall be forced into action before much longer. Apart from anything else, it means that escaping from the house and posting my column to our beloved editor would try the patience of even the most hardened Colditz escapee. The old tactics are probably the best — run!

Some post that has managed to slip through the net and get delivered by a postman no doubt wearing a suit of armour lies afore me now, so what have we got, and who are we going to assist this month?

Well, from the look of the first two letters we're not going to assist anyone, they're both giving illuminating and copious help on a couple of games that have troubled a lot of people.

First of all, we have Richard and Charles Beighton, who live in Haywards Heath, West Sussex. Rather like my own humble abode of Wigan there is probably precious little else to do there other than play adventures, and they have sent in reams of hints for Demon Knight. Are you ready for all this …

1) In throne room, pull torch to reveal a secret room.
2) In armoury, get lance then bellows.
3) Get broom from courtyard, and on the path sweep it to reveal a hole.
4) Get the iron glove.
5) Use lance to get key off top of sign post.
6) Get flower from field.
7) Go to farm, get shovel, dig main path to reveal knife.
8) Get acorn from dung heap (some biting computer satirical comment there, surely?) and use knife to kill cow (how cruel!).
9) Go to pond, which is full of alkali, wear metal glove, get bellows, suck up alkali, go to locked gate, blow bellows to open gate.
10) Unlock castle door with key, then go castle.
11) Get bucket from kitchen, then go back to heap and get dung! Urgh!
12) To get rid of obnoxious monster, wave flower.
13) To get to library, you must lay ladder across chasm.
14) In library you must read book, which tells you how to kill demon.
15) Dig hole in garden, plant acorn, drop dung in hole.
16) Get invisible cloak off witch, suggestion is suck up water from well in bellows and kill witch, get cloak (it says here).
17) Use mandrake root and bloody knife, wearing cloak of invisibility, and go and kill demon.

If you are having problems with that particular game then the above should have sorted a few things out. Since there are so many hints I couldn't print them all backwards (Helen would never let me, I'm sure), so as they roughly follow the order of game play then I suggest that you just read up to the point at which you're stuck and then read no more. Until you get stuck again, of course, as always seems to be the way …

Andrew McBride is a name rapidly becoming familiar to these hallowed pages, and since he ends his letter with a million and one adventures on which he can offer help, we shall start with his address. This is 109 Main Street, Little Harrowden, Near Wellingborough, Northants NN9 5BA, Saturday the … wait a minute, we're not making that mistake again!

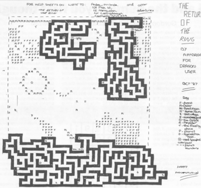
Astute readers may have noticed a map for *Return of the Ring* somewhere close to the column. This was kindly sent to me by Andrew, who says that the original map when first drawn was massive and had to be reduced to A4 size. I can well believe it. The date on the map he explains by saying that he hasn't had time to write recently because (and I quote) "I have just had my dreaded exams. This brings me onto the next subject. I am only 14 years old and have completed more adventures than that 16 year old boy, so there!" End of quote, hope you did well in your exams, and no doubt 16 year old boy will be writing in with lists and lists of adventures that he's solved, some probably before they were even written.

After the map and the insult, a plea. He's managed to get a copy of *Total Eclipse*, and as many other people have found he is unable to lay his hands on Universe Two, so if anyone (stop grovelling, Andrew) can help him out here then you've got the address to write to.

Plea number two. After his hints on *The Final Mission* (Ket Trilogy) were published the other month, he has been unable to get any further with that particular game. One knows the feeling well, dear boy. So, if anyone has solved it, would you please let us know.

To wrap up Andrew's chatty little missive, he can offer help on the following adventures in return for an SAE. Deep breath, and here we go. *Juxtaposition, Return of the Ring, Ring of Darkness, Mansion, Jerusalem, Williamsburg, Ultimate, Vortex Factor, Aquanaut 471, Calixto Island, Quest, Castle Adventure, El Diablero, Wings of War, Cricklewood Incident, Mountains of Ket, Temple of Vran*. If he's just been sitting his exams, how did he find the time to solve so many games, one cannot help but wonder. Presumably his school teachers are the only ones not to be shown copies of *Dragon User*. Your secret is safe with me, in return for the usual bribes, tips on the nags, etc.

Brief diversion, talking about nags. For months and months two of us had been telling people to back Rhyme 'n' Reason in the Grand National, then at the last moment we both changed our minds! Rhyme 'n' Reason holds on gamely to win, my


FOR HELP SHEETS ON THE RETURN OF THE RING WRITE TO: Andrew McBride, 109 Main St., Gt Harrowden, Nr. Wellingborough, Northants and other adventures
THE RETURN OF THE RING
BY A McBRIDE FOR DRAGON USER
OCT '87
Key
F - forest
M - Crater
P - planet
HAPPY ADVENTURING

friend's horse finished fourth, and mine? It was what that oaf with the hats on Channel 4 refers to as a 'screamer'. It must have been. Sacred Path, backed down to favourite (rough definition of a 'screamer', for non-racing folk), was brought down at the first fence. Let that be a lesson to you all …

Back to the land of adventures, and a letter all the way from Kuwait. The address says something about 60,000 Alimadi. Must have long roads in Kuwait. The name? Ahah, now therein lies a mystery. According to the envelope it's G.E. Convey, but the signature gives one the impression that the first name of this person is Girly. Shome mishtake, shurely?

Well, whoever he or she is, they want help with *Madness and the Minotaur*. Read the January 1988 issue of *Dragon User*, say I, or alternatively wait until my air mail post reaches you. I'm glad it was an SAE, I'd never have made out the name and address myself!

The Hulk is not an adventure that often crops up, and having played it I can see why. However, for the benefit of an indecipherable signature from Redhill, and anyone else who might be stuck, here's a few hints.

There are twelve gems to be found in all. There are also three domes, and (hope you've drawn a map) each dome needs to be lifted to find one gem. Then, near the western-most dome you must dig four times to find a gem, the bottom eastern dome requires that you dig 7 times (stupid, isn't it?), while the top eastern dome requires a more simple input of digging once. That's half the gems.

Back to the western dome. Go dome and west, where you will need the wax. Then, bite lip until Dr. Strange points at the base board. Look at baseboard and plug hole with wax. Bite lip again (what's wrong with wait?) and talk to Strange three times to get some information and a gem. Get the wax back.

Still in the western dome plug ears with wax, hold nose, close eyes, and get ants. Take them north, north, go crack, and thus bring the ants here.

Bottom eastern dome. Wave fan at mesh to dispel bees.

Top eastern dome, when you've found the room with the button in the wall. Press the button to allow you to remain HULK for one move, letting you go out safely as hulk.

Go east. Bite lip (will you have any left by the time the game's finished?!), remember nightmare, west, lift ring to help here.

Remember nightmare again before going through the hole. Eat the egg and scratch the wall, leaving the bio-gem to be found here as your very last treasure.

As I said, not one of my all time favourites, since there is very little logic in digging four times here, seven times there, talking to someone three times until they pay attention to you, and so on. Adventure puzzles of this sort, to my way of thinking anyway, are totally banal. It's like my other pet hate, mazes, although many adventures seem to feature them.

An adventure should be a test of someone's brain power and their ability to think logically, not their perseverance in trying something over and over again, slightly differently each time, until it works. Puzzles of that nature should be banned!

Climbs off soap box, finishes column. Bye for now!

Adventure Contact

To help puzzled adventurers further, we are instituting an Adventure Helpline — simply fill in the coupon below, stating the name of the adventure, your problem and your name and address, and send it to Dragon Publications, 49 Alexandra Road, Hounslow, Middlesex TW3 4HP, United Kingdom.

Adventure ....
Problem ....
....
Name ....
Address ....
....

...and add the number you first thought of

Gordon Lee finds that hailstones tend to snowball

OVER the past five years we have, from time to time, considered a number of unsolved mathematical mysteries — many of which date from pre-computer times — but in which the computer can now prove to be a valuable tool where conventional mathematics has failed to find an answer. The fact that these mysteries still defy all attempts upon them shows that, even with the power of the computer, they are not going to yield their secrets easily, but there is no reason why the enthusiastic amateur may not succeed where the professional has failed. Take for example the case the the 'Hailstone' numbers which were discussed more fully in DU August and September 1984. The idea behind hailstone numbers is simplicity itself:

Take any positive whole number. If the number is even, divide it by 2. If it is odd, multiply it by 3 and add 1. This will give you another number, so repeat the last excercise.

The enigma is that no matter what number you take, you will always, eventually, end up with 1. For example, starting with 3 the series would run:

3, 10, 5, 16, 8, 4, 2 and finally 1.

As yet, there is no proof as to *why* this should be. Why should the total for certain numbers not increase without limit? Another possibility would be a certain series of values forming an endless loop of repeating numbers. In the absence of any proof the subject is wide open to investigation, for example, by finding just one value that doesn't conform to expectation. Discovering it, however, is another matter!

A subsidiary problem with hailstone numbers is predicting, for a given starting number, the number of steps required to reach 1, and the maximum value reached during the operation. In the case of 3 (shown above) seven steps are required and a maximum of sixteen is reached. This information can only be arrived at by actually performing the calculation. As yet, there is no formula that will produce either of these values directly. A quick test with a few low numbers will rapidly show the erratic nature of these values. Why, for example, do the starting values 26 and 28 have steps of 10 and 18 respectively, and reach maxima of 40 and 52 while starting value 27 needs 111 steps and reaches a maximum of 9232?

3	1	3	9	9	1
9	8	3	9	2	9
1	6	4	3	1	2
5	1	7	4	7	1
7	1	5	9	7	1
9	3	7	3	3	9

Perhaps even more infuriating than an unproved rule for which *no* exception can be found would be one in which only one exception could be found. At first, the discovery of this exception might give cause for celebration but, unless this provides a clue to the enigma from which a proof can be found, the exception might be even more perplexing than if one had not been found! A typical example of this sort was considered recently (October 1987) when we looked at numbers which can be both square and pyramidal. A similar puzzler is to be found converning 'palindromic' numbers.

A palindromic number is one which reads the same forwards as backwards (as is the case with palindromic words and sentences). Now consider the (unproved) rule that all perfect cubes which are also palindromic will have a palindromic cube root. Note that this is *not* the same thing as saying that the cubes of palindromes will be palindromic! A couple of simple examples would be 1331, the cube of 11, and 1030301, which has 101 as its palindromic cube root. So far so good. But then just one palindromic cube was found which did *not* have a palindromic cube root. The number was 10662526601 and its cube root is 2201 — a number deinitely not palindromic. Computers have carried out the search on very high cubes and all which are themselves palindromic always have a cube root with this property. But why this one exception? That is still a mystery — as is the existance of a second exception to the rule. Another unsolved problem relating to palindromes is as follows:

Take any positive integer, reverse the digits, and add the two numbers together. Repeat the process until the number becomes palindromic. For example,

```
 723
 327
 ---
1050
0501
----
1551
----
```

Prize

SOME people, we are aware, can do six impossible things before breakfast. We, a small organisation, can only offer five improbable things, and it's up to you when you do them, but here they are: *Mublingly, Cecil Plays 21, Roulette, Craps* and *Telepath* — all on *5 Games Tape* for the Dragon. Available from Preston Computer Games, there are ten of these five for the ten people who can produce the largest hailstones.

Rules

Raise your umberellas, pull down your hoods of silence and concentrate. When the storm has subsided, your Dragon should be telling you (or you should be telling it) the smallest number which produces a hailstone of one million. Write it down. Print it out. Send us the listings, your solution, your name and address and DON'T FORGET WE HAVE A NEW ADDRESS THIS MONTH! Don't panic — Carol won't burn your letters if they go to Little Newport Street, but so much the better if they go to Dragon Publications, 49 Alexandra Road, Hounslow, Middx TW3 4HP. And put JUNE COMPETITION on the envelope, please.

What about a tiebreaker? I'm letting you off lightly for the good of the community this month. Just suggest one way, as improbable as you like as long as it's legal and doesn't involve your editor in serious personal embarrassment, of promoting the Dragon in general and *Dragon User* in particular. Rhymes strictly optional!

March winners

WE were a little thrown by two contestants in succession coming up with identical wrong answers. Just when we began to wonder if we had done something wrong, nearly everybody else came along with right ones. A mystery which may be unravelled. The ten tidiest solutions came from Philip Davies of Norwich, F J Taylor of Middlesbrough, Joseph James of Malta, Fred Willers of Stone, Paul Priestland of Lechlade, Ted Newman of Addlestone (despite the printout!), D J Gray of Middlesbrough, Randy Longshore of Chesterfield MO (who says its Ewcg in Sawhally. Don't send the *Abdabs* to A&B, Randy, send it to Computape; see News pages), R Hames of Milton Keynes and Robin Telkman of Sale, who seems to have got his own back about the tiebreakers.

The paradise island of *Zotoka* is on its way to each of you, thanks to Preston Computer Software.

Nobody had a *really* good excuse for going to a paradise island, I've decided — I'm going instead. Editor's privilege. (*Little does she know it's just a large roundabout with a duckpond in the middle.*)

Solution

See opposite.

Here a palindromic number is reached after just two reversals. At first right it might be thought that with the exception of a few low starting numbers the chance of forming a palindrome is slight. In fact, the reverse is true and a theory has been given (as yet unproved) that *all* numbers will eventually result in a palindrome, most of them in comparatively few steps. Once again, there are exceptions to the rule and a number of values have been found by computer which have so far not obliged! The smallest of these is 196 which has been computed to many thousands of steps and has still failed to become palindromic.

Here at *Dragon User* we have our *own* unsolved problem with the 'Primesearch' puzzle. This first appeared in May 1984 and again in February 1987. The object was to complete a 6 x 6 grid of digits such that as many different prime numbers as possible are contained within the grid. These can read in any direction but only in a straight line (as in the more familiar 'wordsearch' puzzles). So far, no improvement on my own grid (shown here) has been received. Of course, finding a higher scoring grid is one thing, but *proving* that there is no higher one possible is another kettle of fish! Readers who still wish to take up this challenge might like to test their technique by extracting all of the primes from this grid. Including 1, there are one hundred and seventy of them!

This month, in a bout of generosity, there are *two* competition problems! One is not too difficult, and the other is not too easy (which is not the same as saying that one is easy and the other is difficult!), and you *only have to do the first one to enter our prize competition*, but for those of you who think you can unravel puzzle 2 — we'll publish the best solution.

First, the easier of the two:

We began this month be mentioning hailstone numbers. What we would like to know is 'What is the smallest starting number which will, while being "hailstoned", produce a maximum which exceeds one million?

That's the competition problem. The optional extra problem is simply a coded message to decode: it is a quotation with particular aptness for readers of this page — yet it was written during the first half of the nineteenth century:

XZF VCZT VTETWUPIWJG BGVLIF P KDLJ EEF JZ LWOA MAQKFSU

Can you decipher it?

The Answer

This is Gordon Lee's own solution to the March competition see page 26 for results

ANSWER: The Gray code to binary conversion is as follows:

Gray code 1111111 101010101
Binary 10101010 110011001

Solution: There are several algorithms which can be used to convert from Gray codes to standard binary (and vice-versa). This problem, which was set by Graham Barber, one of our readers, uses the following method for its solution:

"Write down the fist digit of the Gray code (left-hand end). For each subsequent digit write the digit down if the preceding digit is a 0, otherwise change the digit (from 0 to 1 or 1 to 0) if the preceding digit is a 1.

This can be readily tried out on the two examples above. Graham's listing is below:

```
1000 K=0                                  'Value of last bit output
1010 P=32                                 'Screen print position
1020 K$=INKEY$:IF K$=""THEN 1020
1030 IF K$=CHR$(13) THEN 9000             'End of Input
1040 IF K$<>"0" AND K$<>"1" THEN 1020     'Illegal Input
1050 PRINT @ P,K$;                        'Print Input
1060 IF K=0 THEN 1080                     'If previous O/P was '0' New O/P=Input
1070 IF K$="0"THEN K$="1" ELSE K$="0"     'Output = Inverse of Input
1080 K=VAL(K$)                            'Save value of output
1090 PRINT @ P+256,K$;                    'Print Output
1100 P=P+1                                'Next position for Print
1110 IF P>254 THEN 9000                   'Screen Full
1120 GOTO 1020
9000 END
```

Communication

Problem: *If I Had A Million* — I can't load side 2 of the adventure tape, Phoenix Software has "gone away". Will pay cost of tape and postage if someone will CLOAD and CSAVE it for me, please.
Name: Pam D'Arcy, 21 Wycombe Lane, Wooburn Green, High Wycombe, Bucks HP10 0HD.

Problem: Could anyone sell me a single drive disc drive and a few discs to get me started.
Name: Michael McCullough
Address: 129 Cregagh Road, Belfast, N. Ireland, BT6 0LA.

Problem: I need someone to write me a fairly simple program to help me use my Dragon at work. Cash paid for help.
Name: Mark Matthews
Address: 14 Grantley Close, Ashford, Kent TN23 1UE.

Problem: I need someone to put the 64 column program (see *Dragon User* December 1987) written by Paul Harrison onto cartridge. I have a Dragon Data one which could be used.
Name: Paul Cartwright
Address: 95 Matlock Crescent, Cheam, Surrey SM3 9SS

Only room for a lone adventurer this month . . .

Adventure: *Time Machine*
Problem: Cannot find the third prism, have found the one on the island and in the crows nest.
Name: Matthew Chamberlain (aged 9)
Address: 5A Kemble Road, Tuffley, Gloucester GL4 0JL.

Communications

Write down your problem on the coupon below (make it as brief and legible as possible) together with your name and addres and send it to Dragon Publications, 49 Alexandra Road, Hounslow, Middx

Problem ....
....
....
....
Name ....
Address ....
....
....

Dragon Answers

If you've got a technical question write to Brian Cadge. Please do not send a SAE as Brian cannot guarantee to answer individual inquiries.

Baud with going slow

COULD you please explain what the baud unit in 'baud rates' really is, and why faster rates than 2400 are not used on bulletin boards, as this would surely save on the cost of the phone calls?

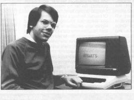
S. Scoltoch
Oakdale Road
Downend
Bristol

THE baud rate is the maximum rate at which the signal in a serial link can change each second. For example, 2400 baud means that the signal can change from -12 volts to +12 volts a maximum of 2400 times per second.

As the vast majority of serial protocols (like RS232) use only one 'state' for each transmitted 'bit' of data (0 is -12V and 1 is +12V), the baud rate is effectively the number of bits per second, or roughly ten times the number of characters per second (allowing for start/stop bits) that can be sent or received.

The public telephone system does not cover a particularly wide frequency range (which is why a voice on the phone does not sound like a voice on the TV). The higher the baud rate used, the higher the frequency of the signal that the modem connected to the phone line will produce. Hence, very high baud rates would produce a frequency beyond the capacity of the analogue phone system.

The theoretical upper limit is actually quite a bit higher than 2400 baud, but when line 'noise' is taken into account this is the most reliable fastest speed.



Turn black and white to colour

I have managed to get my hands on an old Commodore 1901 colour monitor, which I want to connect to my Dragon 32. I have connected the monitor socket to the 'Lum' pin on the monitor, but all I get is a black and white picture.

Can you please explain how to make the Dragon output a colour signal at the monitor socket?

Keith Parsons
Basingstoke
Hants

THE Dragon's monitor socket outputs a colour composite video signal (ie colour and brightness information is mixed together). The monitor you are using has separate inputs for brightness and colour.

All you should need to do is connect the video output from the Dragon to both the Lum and Colour pins at once. The sound input can also be connected, as it should be compatible with the Dragon's output at the monitor socket.

Every sign of a real sine wave

I would like to know what a sign curve looks like, and how can I make my Dragon 32 draw one. My friend says his Atari can draw these curves but that Dragons cannot.

Daniel Ward
Hagley Road
W. Midlands
(Aged 7 and a quarter)

YOUR Dragon can certainly draw sine curves as good as (probably better than) your friend's Atari. Type in and RUN the following program, that should convince him!

```
10 PMODE 4,1:COLOR 0,1:PCLS:SCREEN 1,1
20 FOR A=0 TO 6.283 STEP 0.025
30 PSET(A*40,96+(SIN(A)*90),0)
40 NEXT A
```

Stuck in the middle of an EXEC key stroke

I'M retired and have only just managed to learn Basic programming. I was appending a program using the normal POKE 25 and 26 with the EXEC 33773, but I think I made a mistake and typed 33773 instead. Ever since then every time I use the '2' key or the speech marks I get repeating 2s or speech marks.

T. Connor
9 Kevington Drive
Orpington
Kent BR5 2NT

IT is not possible to damage your computer by typing in an incorrect EXEC address. At worst you'll cause the machine to lock up, and have to turn the power off and on again.

Your problem seems to be caused by the 2 key on the keyboard physically sticking down (I assume you've got a '64). You can try taking the top off your Dragon and cleaning this key)as it's easily accessible on the edge of the keyboard). If this doesn't cure it, you'll have to seek professional advice from a computer repair outfit. (Try Harry Whitehouse on 0636 705230. He may know someone reliable.)

Classified

WANTED: Dragon Pascal (Oasis) with manual etc. Tel. 085889 338 (evenings).

DRAGON Software and hardware. Very cheap. Send an SAE for list. Mr. G M Hunt, 74 Ferndale Road, Leytonestone, London E11 3DN.

TWO Dragon 32 computers, with compatible Cumana twin disc drive, NEC (PC-8023BE-N) dot matrix printer, 5in b/w television, cassette recorder, Dragon *Super Writer II*, MST Home Accounts/database/spreadsheet programs, books, complete set of DU mags from July 1983 — £350. Will not split. Buyer to collect. New Milton (0425) 614268.

ACCOUNTANCY program by Goldstar Software, for Edit+, £3. Send to Michael McCullough, 129 Crenach Road, Belfast with SAE. (0232) 58851.

DRAGON 32, boxed, complete, plus 19 original games, 5 utilities, £75. Tel. (0752) 781504.

HERE'S MY CLASSIFIED AD.
(please write your copy in capitals on the lines below)

Name ....
Address ....
.... **Tel:** ....

Classified rate: 35p per word.

Please cut out and send this form to: Classified Department
Dragon Publications, 49 Alexan dra Road, Hounslow, Midd x